



International Space Station Command and Data Handling Book

ISS-Expedition 1

**Mission Operations Directorate
Operations Division**

**Preliminary
March 11, 1998**

These procedures are available
electronically on the SODF Homepage
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National Aeronautics and
Space Administration

Lyndon B. Johnson Space Center
Houston, Texas



**INTERNATIONAL SPACE STATION
COMMAND AND DATA HANDLING BOOK
ISS-EXPEDITION 1**

PRELIMINARY
March 11, 1998

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This document is not currently under the configuration control of the Systems Operations Data File Control Board (SODFCB). During the interim, changes may be submitted to the book manager.

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The SODF procedures listed here are for the use of the Expedition 1 crew. By final publication, all applicable Increment 1 procedures will be included in this list. The current list of procedures is for use from 2R docking to 5A docking based on Rev C Assembly Sequence.

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NOMINAL

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EPICS SETUP

1. UNSTOW PCS
 - TBD PCS - Two Thinkpads
 - Two 25-foot DC PWR cables
 - If Shuttle AFD
 - Two 6-foot DC PWR SPLY cables
 - Two ORB 1553 Data cables
 - US DC PWR SPLY
 - If ISS RS
 - 1553 Data/power Cable
 - RS DC PWR SPLY
2. VERIFY POWER OFF
 - Pwr Sply If Shuttle AFD
 - √PCS1 DC PWR SPLY PWR switch - Off
 - √PCS2 DC PWR SPLY PWR switch - Off
 - See UTILITY OUTLET PLUG-IN PLAN ORBIT CONFIGURATION (REF DATA FS, UTIL PWR) for DC UTIL PWR outlet availability
 - TBD √DC UTIL PWR - Off
 - PDIP √PDIP UTIL PWR - Off
 - If ISS RS
 - √RS Power switch - Off
3. MAKE PCS POWER AND DATA CABLE CONNECTIONS
 - √1553 PC Card, Adapter Cable inserted in PC slot in both PCs
 - If Shuttle AFD
 - TBD Connect both 25-foot DC PWR SPLY cables to PCS1,2 DC PWR outlet DC PWR SPLY outlet (J2).
 - PDIP Connect PCS1 6-foot Orb DC PWR SPLY cable to DC UTIL PWR outlet DC PWR SPLY outlet (J1).
 - PDIP Connect PCS2 6-foot Orb DC PWR SPLY cable to PDIP UTIL PWR outlet DC PWR SPLY outlet (J1).
 - PDIP Connect PCS1 Orb 1553 Data cable to (PDIP Data Port 1?) outlet 1553 PC Card Adapter Cable.
 - PDIP Connect PCS2 Orb 1553 Data cable to (PDIP Data Port 2?) outlet 1553 PC Card Adapter Cable.
 - If ISS RS
 - TBD Connect 1553 Data/Power Cable to PCR outlet DC PWR SPLY outlet (J1) 1553 PC Card Adapter Cable.
 - Connect RS Power Cable to the IOA outlet.

	4. <u>TURN ON PCS</u>
TBD	If Shuttle AFD DC UTIL PWR → On
Pwr Sply PDIP	PCS1 DC PWR SPLY PWR switch → On (Lt On) PDIP UTIL PWR → On
Pwr Sply	PCS2 DC PWR SPLY PWR switch → On (Lt On)
PCS	PCS 1,2 Thinkpad PWR switches → On
	If ISS RS
TBD	RS Power switch → On
PCS	PCS Thinkpad PWR switch → On

NOTE

Let the PCS cycle through the initialization screens without any keystroke inputs. System boot takes approximately 3 to 4 minutes. Defaults are preset to select Solaris operating system and boot PCS Command and Display System Files.

	5. <u>CONNECT PCS TO MDM DATA (if MDMs are up and running)</u>
PCS2	After bootup when taskbar appears at bottom of display

sel Arrow directly above 'PCS' logo (as required)

sel Start/Restart PCS CDS (as required)

sel Icon to open PCSCDS Main Control Panel Window (as required)

✓Status Box is Green and 'Connected' is displayed in the PCSCDS Main Control Panel Window (as required)

Iconify PCSCDS Main Control Panel Window

 * If Status Box is not Green, select 'Connect to MDM' button *
 * if the MDMs are on *

NOTE

1. PCS connection to MDM is indicated by 'Green' in the Status Box and/or 'Connected' message displayed in the PCSCDS Main Control Panel Window only when the Prime Node MDM is up and running.
2. If MDMs are not up and running and step 5 is executed Expect a PCS 'CW Server Error Msg' and a 'CDS Signon Fail'.
3. After connected to the MDMs if the PCS receives a Disconnect message open the PCSCDS Main Control Panel Window and select 'Connect to MDM' button to Reconnect. If no joy close all displays and anything iconified and redo Step 5. If still no joy, perform the Loss PCS Malfunction Procedure.

6. CONFIGURE PCS FOR NODE 1 DISPLAYS (as required)

sel Arrow above 'PCS' logo
sel Start PCS CDDF display

After appox 1 minute,
✓'Increment 2A Home Page' is displayed.

Displays may now be selected as desired.

Inform **MCC-H** when complete.

EPKS DEACTIVATION

1. POWER DOWN PCS

Close all display windows.

At the Taskbar on bottom of display
sel EXIT

On 'Logout Confirmation' window
sel OK

When 'Type any key to continue' appears

If Shuttle AFD

PCS PCS 1,2 Thinkpad PWR switches → Off

Pwr Sply PCS1 DC PWR SPLY PWR switch → Off (Lt Off)
 PCS2 DC PWR SPLY PWR switch → Off (Lt Off)

TBD DC UTIL PWR → Off

PDIP PDIP UTIL PWR → Off

If ISS RS

PCS PCS Thinkpad PWR switch → Off

TBD RS Power switch → Off

2. DISCONNECT EPKS POWER AND DATA CABLE

If Shuttle AFD

PDIP Disconnect both Orb 1553 Data cables to (PDIP Data Ports 1,2) outlet
 1553 PC Card Adapter Cable.

Disconnect both 6 foot Orb DC PWR SPLY cable to DC UTIL PWR
outlet DC PWR SPLY outlet (J1).

Disconnect both 25 foot DC PWR SPLY cable to EPKS DC PWR
outlet DC PWR SPLY outlet (J2).

If ISS RS

TBD Disconnect RS Power Cable.

Disconnect 1553 Data/Power Cable to PCR outlet DC PWR SPLY
outlet (J1) 1553 PC Card Adapter Cable.

- TBD 3. STOW PCS
- PCS - Two Thinkpads
 - Two 25 foot DC PWR cables
 - If Shuttle AFD
 - | Two 6 foot DC PWR SPLY cables
 - | Two ORB 1553 Data Cables
 - | US DC PWR SPLY
 - If ISS RS
 - 1553 Data/Power Cable
 - RS DC PWR SPLY

CHANGE NCS CONFIGURATION

PCS 1. VERIFY HEALTH AND STATUS OF MDM

Node 1: C&DH: Primary(Secondary) MDM

NODE 1: C&DH: MDM: Primary(Secondary)

✓Frame Count - <Incrementing> (MDM is operational)
✓MDM BIT Status - <blank> (No MDM errors)

'MDM Major State'

✓STATE - Primary(Secondary) (MDM is operational)

'Configuration'

✓Configuration - current configuration

NOTE

The possible NCS configurations are:

- 1 = Flight 2A configuration
- 2 = Flight 1R configuration
- 3 = Flight 3A configuration
- 4 = Flight 4A configuration
- 5 = Flight 5A configuration (pre CCS activation)
- 6 = Flight 5A configuration (post CCS activation)
- 7 = Flight 13A configuration

2. SEND COMMAND TO CHANGE CONFIGURATION

To change the configuration for the Primary NCS

PCS Node 1: C&DH: Primary MDM

NODE 1: C&DH: MDM: Primary

sel Configuration

cmd Prim_NCS_Sel_Config_[X] Execute [X] = New config

sel Close

NOTE

The MDM will perform a warm restart. The secondary MDM will then become the Primary MDM.

PCS Node 1: C&DH: Secondary MDM

NODE 1: C&DH: MDM: Secondary

✓Frame Count - <Incrementing> (MDM is operational)
✓MDM BIT Status - <blank> (No MDM errors)

'MDM Major State'

✓STATE - Primary(Secondary) (MDM is operational)

'Configuration'
√Configuration - current configuration

Perform MDM transition procedure to transition Secondary MDM to Primary if required.

Go to step 3.

PCS To change the configuration for the Secondary NCS

Node 1: C&DH: Secondary MDM

NODE 1: C&DH: MDM: Secondary

sel Configuration
cmd Second_NCS_Sel_Config_[X] **Execute** [X] = New config
sel Close

NOTE

The MDM will perform a warm restart. The secondary MDM will then become the Primary MDM.

PCS Node 1: C&DH: Secondary MDM

NODE 1: C&DH: MDM: Secondary

√Frame Count - <Incrementing> (MDM is operational)
√MDM BIT Status - <blank> (No MDM errors)

'MDM Major State'
√STATE - Primary(Secondary) (MDM is operational)

'Configuration'
√Configuration - current configuration

3. **VERIFY STATUS OF THE NEW CONFIGURATION**

PCS Node 1: C&DH: Primary(Secondary) MDM

NODE 1: C&DH: MDM: Primary(Secondary)

If Configuration 2 was selected

If Primary MDM

sel CB_GNC_ [X] bus [X] = 1 for N1-1 or 2 for N1-2
sel RT Status
√RT Inhibited 22,23,24 - <blank>

sel UB_EPS_N1_14 bus
sel RT Status
√RT Inhibited 18,19,20 - <blank>

sel UB_EPS_N1_23 bus
sel RT Status
√RT Inhibited 18,19,20 - <blank>

sel UB_ORB_N1_[X] bus [X] = 1 for N1-1 or 2 for N1-2
 sel RT Status
 √RT Inhibited 8,24 - <blank>

If Secondary MDM
 sel UB_ORB_N1_[X] bus [X] = 1 for N1-1 or 2 for N1-2
 sel RT Status
 √RT Inhibited 8 - <blank>

If Configuration 3 was selected
 If Primary MDM
 sel CB_GNC_[X] bus [X] = 1 for N1-1 or 2 for N1-2
 sel RT Status
 √RT Inhibited 22,23,24 - <blank>

If N1-2 MDM
 sel LB_SYS_LAB_2 bus
 sel RT Status
 √RT Inhibited 18,19,20 - <blank>

sel UB_EPS_N1_14 bus
 sel RT Status
 √RT Inhibited 11,12,18,19,20 - <blank>

sel UB_EPS_N1_23 bus
 sel RT Status
 √RT Inhibited 11,12,18,19,20 - <blank>

sel UB_ORB_N1_[X] bus [X] = 1 for N1-1 or 2 for N1-2
 sel RT Status
 √RT Inhibited 8,24 - <blank>

If Secondary MDM
 If N1-2 MDM
 sel LB_SYS_LAB_2 bus
 sel RT Status
 √RT Inhibited 18,19,20 - <blank>

sel UB_ORB_N1_[X] bus [X] = 1 for N1-1 or 2 for N1-2
 sel RT Status
 √RT Inhibited 8 - <blank>

If Configuration 4 was selected
 If Primary MDM
 sel CB_GNC_[X] bus [X] = 1 for N1-1 or 2 for N1-2
 sel RT Status
 √RT Inhibited 22,23,24 - <blank>

```

    If N1-1 MDM
      sel LB_SYS_LAB_1 bus
      sel RT Status
      √RT Inhibited 18,19,20 - <blank>

    If N1-2 MDM
      sel LB_SYS_LAB_2 bus
      sel RT Status
      √RT Inhibited 15,16,17,18,19,20 - <blank>

      sel UB_EPS_N1_14 bus
      sel RT Status
      √RT Inhibited 11,12,18,19,20,23,28 - <blank>

      sel UB_EPS_N1_23 bus
      sel RT Status
      √RT Inhibited 11,12,18,19,20,23,28 - <blank>

      sel UB_ORB_N1_[X] bus      [X] = 1 for N1-1 or 2 for N1-2
      sel RT Status
      √RT Inhibited 8,24 - <blank>

    If Secondary MDM
      If N1-1 MDM
        sel LB_SYS_LAB_1 bus
        sel RT Status
        √RT Inhibited 18,19,20 - <blank>

      If N1-2 MDM
        sel LB_SYS_LAB_2 bus
        sel RT Status
        √RT Inhibited 18,19,20 - <blank>

        sel UB_ORB_N1_[X] bus      [X] = 1 for N1-1 or 2 for N1-2
        sel RT Status
        √RT Inhibited 8 - <blank>

    If Configuration 5 was selected
      If Primary MDM
        sel CB_GNC_[X] bus      [X] = 1 for N1-1 or 2 for N1-2
        sel RT Status
        √RT Inhibited 22,23,24,27,28,29,30 - <blank>

        If N1-1 MDM
          sel LB_SYS_LAB_1 bus
          sel RT Status
          √RT Inhibited 5,9,18,19,20,21, 29,30 - <blank>

```

```

    ~
    ~
    ~
    If N1-2 MDM
      sel LB_SYS_LAB_2 bus
      sel RT Status
      √RT Inhibited 5,9,18,19,20, 29,30 - <blank>

      sel UB_EPS_N1_14 bus
      sel RT Status
      √RT Inhibited 11,12,18,19,20,23,28 - <blank>

      sel UB_EPS_N1_23 bus
      sel RT Status
      √RT Inhibited 11,12,18,19,20,23,28 - <blank>

      sel UB_ORB_N1_[X] bus      [X] = 1 for N1-1 or 2 for N1-2
      sel RT Status
      √RT Inhibited 8,24 - <blank>

    If Secondary MDM
      sel CB_GNC_[X] bus      [X] = 1 for N1-1 or 2 for N1-2
      sel RT Status
      √RT Inhibited 27,28,29,30 - <blank>

    If N1-1 MDM
      sel LB_SYS_LAB_1 bus
      sel RT Status
      √RT Inhibited 5,9,18,19,20,21,29,30 - <blank>

    If N1-2 MDM
      sel LB_SYS_LAB_2 bus
      sel RT Status
      √RT Inhibited 5,9,18,19,20, 29,30 - <blank>

      sel UB_ORB_N1_[X] bus      [X] = 1 for N1-1 or 2 for N1-2
      sel RT Status
      √RT Inhibited 8 - <blank>

    If Configuration 6 was selected
      If Primary MDM
        sel CB_GNC_[X] bus      [X] = 1 for N1-1 or 2 for N1-2
        sel RT Status
        √RT Inhibited 28,29,30 - <blank>

        sel LB_SYS_LAB_[X] bus      [X] = 1 for N1-1 or 2 for N1-2
        sel RT Status
        √RT Inhibited 29,30 - <blank>

```

```
~  
sel UB_EPS_N1_14 bus  
sel RT Status  
√RT Inhibited 11,12,18,19,20,23,28 - <blank>  
  
sel UB_EPS_N1_23 bus  
sel RT Status  
√RT Inhibited 11,12,18,19,20,23,28 - <blank>  
  
sel UB_ORB_N1_[X] bus      [X] = 1 for N1-1 or 2 for N1-2  
sel RT Status  
√RT Inhibited 8 - <blank>  
  
If Secondary MDM  
sel CB_GNC_[X] bus      [X] = 1 for N1-1 or 2 for N1-2  
sel RT Status  
√RT Inhibited 28,29,30 - <blank>  
  
sel LB_SYS_LAB_[X] bus    [X] = 1 for N1-1 or 2 for N1-2  
sel RT Status  
√RT Inhibited 29,30 - <blank>  
  
sel UB_ORB_N1_[X] bus      [X] = 1 for N1-1 or 2 for N1-2  
sel RT Status  
√RT Inhibited 8 - <blank>
```

4. CHANGE DEFAULT CONFIGURATION

MCC-H - Perform Early Prepositioned Load procedure using new Station Configuration PPL for both MDMs.

NODE 1 REINITIALIZE NODE 1 MDMs

1. VERIFY MDM STATES AND MDM IDs
PCS2(1) Node 1: C&DH: MDM N1-2(1)
PRIMARY NCS MDM Node 1

✓STATE - Primary
✓MDM ID - N1-2(1)

- PCS2(1) Node 1: C&DH: MDM N1-1(2)
SECONDARY NCS MDM Node 1

✓Frame Count - <static>

- PCS2(1) Node 1: C&DH: MDM N1-2(1)
PRIMARY NCS MDM Node 1
'Software Control'

sel Transmit Mode Code

Primary_NCS_Transmit_Mode_Code

sel Primary NCS Xmt Mode Code Commands
cmd Xmt_Stat_Word_Tmplt
enter Bus ID - 2
enter RT Address - 6(5) **Execute**

✓Subsystem Flag Set - X (set)

If Subsystem Flag Bit is set, N1-1(2) MDM is in Diagnostic State and is ready to accept diagnostic commands.

If Reinitialize MDM from EEPROM, go to step 3.
If Reinitialize MDM from DRAM, go to step 2.

2. PERFORM MDM REINITIALIZATION FROM DRAM
PCS2(1) Node 1: C&DH: MDM N1-2(1)
PRIMARY NCS MDM Node 1
'Software Control'

sel MDM Utilities
sel Commands

NOTE

1. Startup process will execute from the UAS currently loaded in DRAM.
2. No POST is performed.

cmd N1_1(2)_MDM_Re_Init_MDM_DRAM Execute

Wait 60 seconds for MDM to reinitialize.
Go to step 4.

- PCS2(1) 3. PERFORM MDM REINITIALIZATION FROM EEPROM
Node 1: C&DH: MDM N1-2(1)
PRIMARY NCS MDM Node 1
'Software Control'

sel MDM Utilities
sel Commands

NOTE

1. Reinitialize MDM from EEPROM will cause the loss of all current information in the DRAM such as BST, current Bus, RT, and application configuration.
2. All UAS and default Configuration Tables will be loaded from EEPROM.
3. Normal POST will also be performed.

cmd N1_1(2)_MDM_Re_Init_MDM_EEPROM Execute

Wait 60 seconds for MDM to reinitialize.

- PCS2(1) 4. VERIFY MDM STATE AFTER REINITIALIZATION
Node 1: C&DH: MDM N1-1(2)
SECONDARY NCS MDM Node 1

✓Frame Count - <incrementing>

'MDM Major State:'

✓STATE - Standby
✓MDM ID - N1-1(2)

```
*****
* If state is not Standby, *
*√MCC
*****
```

- PCS2(1) 5. **ENABLE NCS AUTO RETRY**
Node 1: C&DH: MDM N1-2(1)
PRIMARY NCS MDM Node 1
'Software Control'

sel MDM Utilities
√Primary_NCS_Auto_Retry_Ena - <blank> (Inhibited)

If X (Enable) >>

sel Commands
cmd Primary_NCS_Ena_NCS_Retry Execute

√Primary_NCS_Auto_Retry_Ena - X (Enable)

Node 1 MDM State Transitional Matrixes

		N1-2 Transition				
Initial N1-1 State	Prim => Off, Diag	Prim => Stby	Off/Diag => Prim	Stby => Prim	Stby => Diag/Off	
Primary	1	1	B	B	D	
Secondary	A	A	1	1	3	
Standby	A	A	1	1	3	
Diag/Off	2	3	C(TBD)	1	3	

	N1-1 Transition							
Init N1-2 State	Prim => Sec	Prim => Off/Diag	Prim => Stby	Sec => Off/Diag/Stby	Off/Diag => Prim	Off/Diag/Stby => Sec	Stby => Off/Diag	
Primary	1	1	1	G	1	I	J	
Standby	E	F	F	1	1	1	3	
Diag/Off	3	2	3	1	H(TBD)	1	3	

ACTIONS

A = Transitioning N1-2 to Dgnstc/Stby/Off from Prim & N1-1 to Prim from Stby/Sec
 B = Transitioning N1-2 to Prim from OffDgnstc/Stby while N1-1 is Prim
 C = Transitioning N1-2 to Prim from OffDgnstc while N1-1 is OffDgnstc
 D = Transitioning N1-2 to Dgnstc from Stby while N1-1 is Prim
 E = Transitioning N1-1 to Sec from Prim & N1-2 to Prim from Stby
 F = Transitioning N1-1 to OffDgnstc/Stby from Prim & N1-2 to Prim from Stby
 G = Transitioning N1-1 to OffDgnstc/Stby from Sec while N1-2 is Prim
 H = Transitioning N1-1 to Prim from OffDgnstc while N1-2 is OffDgnstc
 I = Transitioning N1-1 to Sec from OffDgnstc/Stby while N1-2 is Prim
 J = Transitioning N1-1 to OffDgnstc from Stby while N1-2 is Prim

RESULTING STATES

N1-1=Prim	N1-2=Off/Dgnstc/Stby
N1-1=Sec	N1-2=Prim
N1-1=Off/Dgnstc	N1-2=Prim
N1-1=Prim	N1-2=Dgnstc
N1-1=Sec	N1-2=Prim
N1-1=Off/Dgnstc/Stby	N1-2=Prim
N1-1=Off/Dgnstc/Stby	N1-2=Prim
N1-1=Prim	N1-2=Off/Dgnstc
N1-1=Sec	N1-2=Prim
N1-1=Off/Dgnstc	N1-2=Prim

Notes:

- 1 = Illegal States
- 2 = Operationally Feasible, but will lose both boxes at 2 A.
- 3 = Unstable States. Feasible, but will automatically go back to the original configuration.

NODE 1 MDM STATE - A. TRANSITIONING N1-2 TO DIAGNOSTIC/STANDBY/OFF FROM PRIMARY & N1-1 TO PRIMARY FROM SECONDARY/STANDBY

PCS2 1. VERIFY MDM STATES AND MDM IDs

Node 1: C&DH: MDM N1-2

PRIMARY NCS MDM Node 1

✓STATE - Primary

✓MDM ID - N1-2

PCS2 Node 1: C&DH: MDM N1-1

SECONDARY NCS MDM Node 1

✓STATE - Secondary/Standby

✓MDM ID - N1-1

NOTE

If states are not correct, do not execute this procedure.

✓**MCC**

PCS2 2. DISABLE NCS AUTO RETRY

Node 1: C&DH: MDM N1-1

SECONDARY NCS MDM Node 1

'Software Control'

sel MDM Utilities

SECONDARY NCS MDM Node 1

✓Secondary_NCS_Auto_Retry_Inh - X (Inhibited)

If blank (enabled)

sel Commands

cmd Secondary_NCS_Inh_NCS_Retry Execute

✓Secondary_NCS_Auto_Retry_Inh - X (Inhibited)

PCS2 3. COMMAND N1-2 MDM TO DIAG (N1-1 SHOULD GO TO PRIM)

Node 1: C&DH: MDM N1-2

PRIMARY NCS MDM Node 1

'Software Control'

sel MDM FDIR

✓Prim_NCS_Cmd_Xsitn_to_Dgnstc_Inh - <blank> (Enable)

If X (Inhibited)
'MDM Major State'

sel Commands
cmd N1-2_MDM_Cmd_Xsitn_Dgnstc_State_Arm Execute

'Software Control'

sel MDM FDIR
√Prim_NCS_Cmd_Xsitn_to_Dgnstc_Inh - <blank> (Enable)

NOTE

1. Sending the following command will cause the loss of PCS2, Early COMM, and OIU telemetry until OIU reconfiguration and PCS1 reconnection are done.
2. Possible PDI DECOM Fail message.

'MDM Major State:'

sel Commands
cmd N1-2_MDM_Xsitn_Dgnstc_State Execute

PCS2 Node 1: C&DH: MDM N1-2

PRIMARY NCS MDM Node 1

√Frame Count - <static> (Loss of PCS2 telemetry)

Wait 1 minute for N1-1 to go to Primary. N1-1 should go to Primary State after 50 seconds.

4. **RECOVER TELEMETRY ON PCS1 AND VERIFY N1-1 IS PRIMARY**

After boot up (as required), task-bar appears at bottom of display

sel Arrow directly above 'PCS' logo

sel Start/Restart PCS CDS

sel Icon to open PCS CDS Main Control Panel Window

√Status Box is Green and 'Connected' is displayed in the PCS CDS Main Control Panel Window.

NOTE

PCS1 connection to MDM is indicated by 'Green' in the Status Box and/or 'Connected' message displayed in the PCS1 CDS Main Control.

* *****
* If Status Box is not Green, select 'Connect to MDM' icon *
* to reconnect. *
* If still no joy, close all displays and all iconified items and *
* repeat this step. *
* *
* √MCC if Status Box is still not green. *
* *****

NOTE

C&W tone and TBD C&W message will be generated as N1-1 becomes primary and detects N1-2 fails.

PCS1 Node 1: C&DH: MDM N1-1

PRIMARY NCS MDM Node 1

√Frame Count - <incrementing>

'MDM Major State:'

√MDM ID - N1-1

√MDM State - Primary

5. TELEMETRY RECOVERY ON EARLY COMM (GROUND ONLY)

NOTE

Early COMM should reconnect to N1-1 MDM on the other Orb bus automatically in about 10 seconds after N1-1 MDM becomes Primary.

Node 1: C&DH: MDM N1-1

PRIMARY NCS MDM Node 1

√Frame Count - <incrementing>

'MDM Major State:'

√MDM ID - N1-1

√MDM State - Primary

* *****

* If Frame Count is Static after 20 seconds from the moment *

* N1-1 becomes Primary (No Early COMM telemetry received), *

* *

* √MCC *

* *****

6. TELEMETRY RECOVERY ON OIU

NOTE

Possible PDI DECOM Fail message.

CRT **SM 212 OIU**
BUS 4 BC - ITEM 15 EXEC
BUS 3 RT - ITEM 10 EXEC
Change OIU N1 Physical Device to N1-1 - ITEM 18 +4 EXEC

CRT Reload OIU FORMAT 2 - ITEM 1 +2 EXEC

CRT **SM 210 NODE**
√PHY ID PRI MDM - N1-1
√STATE - PRI
√FAIL - <blank>
√FRM CTR - <incrementing>

7. VERIFY N1-2 IS IN DIAGNOSTIC

PCS1 Node 1: C&DH: MDM N1-2
SECONDARY NCS MDM Node 1

√Frame Count - <static>

PCS1 Node 1: C&DH: MDM N1-1
PRIMARY NCS MDM Node 1
'Software Control'

sel Transmit Mode Code

Primary_NCS_Transmit_Mode_Code

sel Primary NCS Xmt Mode Code Commands
cmd Xmt_Stat_Word_Tmplt
enter Bus ID - 2
enter RT Address - 5 **Execute**

√Subsystem Flag Set - X (set)

If Subsystem Flag Bit is set, N1-2 MDM is in Diagnostic State and is ready to accept diagnostic commands.

If transitioning N1-2 to Diagnostic >>
If transitioning N1-2 to Standby, go to step 8.
If powering off N1-2, go to step 9.

- PCS1
8. **IF TRANSITIONING N1-2 MDM TO STANDBY STATE**
Node 1: C&DH: MDM N1-1
PRIMARY NCS MDM Node1
'Software Control'

sel MDM Utilities
sel Commands

NOTE

1. Startup process will execute from the UAS currently loaded in DRAM.
2. No POST is performed.

cmd N1_2_MDM_Re_Init_MDM_DRAM Execute

Wait 60 seconds for MDM to reinitialize.

- PCS1
- Node 1: C&DH: MDM N1-2
SECONDARY NCS MDM Node 1

✓Frame Count - <incrementing>

'MDM Major State:'

✓STATE - Standby
✓MDM ID - N1-2

* If state is not Standby, *
* *
* ✓MCC *

- PCS1
9. **IF POWERING OFF N1-2 MDM**
Node 1: C&DH: MDM N1-2
SECONDARY NCS MDM Node 1

'RPCM _N1RS2_C'

sel RPC 13 (Nod1_2_MDM)

RPCM _N1RS2_C_RPC_13 Detail

sel Commands
cmd Open Execute
✓Position - Op

NODE 1 MDM STATE - B. TRANSITIONING N1-2 TO PRIMARY FROM OFF/DIAGNOSTIC/STANDBY WHILE N1-1 IS PRIMARY

- PCS1 1. VERIFY MDM STATES

Node 1: C&DH: MDM N1-1

PRIMARY NCS MDM Node 1

✓STATE - Primary

✓MDM ID - N1-1

If N1-2 is Off, go to step 2.

If N1-2 is in Diagnostic state, go to step 3.

If N1-2 is in Standby state, go to step 5.

- PCS1 2. IF N1-2 IS INITIALLY OFF, BRING IT TO STANDBY

Node 1: C&DH: MDM N1-2

SECONDARY NCS MDM Node 1

'RPCM_N1RS2_C'

sel RPC 13 (Nod1_2_MDM)

RPCM_N1RS2_C_RPC_13 Detail

✓Position - Op

sel Commands

cmd Close Execute

✓Position - Cl

Wait at least 90 seconds for MDM to start up, finish POST, and go to Standby State.

Go to step 4.

- PCS1 3. IF N1-2 IS INITIALLY IN DIAGNOSTIC STATE, BRING IT TO STANDBY

Node 1: C&DH: MDM N1-2

SECONDARY NCS MDM Node 1

✓Frame Count - <static>

- PCS1 Node 1: C&DH: MDM N1-1

PRIMARY NCS MDM Node 1

'Software Control'

sel Transmit Mode Code

Primary_NCS_Transmit_Mode_Code

sel Primary NCS Xmt Mode Code Commands
cmd Xmt_Stat_Word_Tmplt
enter Bus ID - 2
enter RT Address - 5 **Execute**

√Subsystem Flag Set - X (set)

If Subsystem Flag Bit is set, N1-2 MDM is in Diagnostic State and is ready to accept diagnostic commands.

PCS1 Node 1: C&DH: MDM N1-1

PRIMARY NCS MDM Node 1

'Software Control'

sel MDM Utilities
sel Commands

NOTE

1. Check with **MCC** for which command to send (reinit from DRAM or EEPROM).
2. For DRAM Reinitialization
Startup process will execute from the UAS currently loaded in DRAM.
No POST is performed.
3. For EEPROM Reinitialization
Reinitialize MDM from EEPROM will cause the loss of all current information in the DRAM such as BST, current Bus, RT, and application configuration.
All UAS and default Configuration Tables will be loaded from EEPROM.
Normal POST will be performed.

If reinitialize from DRAM

| **cmd** N1_2_MDM_Re_Init_MDM_DRAM **Execute**

If reinitialize from EEPROM

cmd N1_2_MDM_Re_Init_MDM_EEPROM **Execute**

Wait 60 seconds for MDM to reinitialize.

PCS1 Node 1: C&DH: MDM N1-2

SECONDARY NCS MDM Node 1

√Frame Count - <incrementing>

'MDM Major State:'

√STATE - Standby

√MDM ID - N1-2

- *****
* If state is not Standby, *
* *
* ✓MCC *

- PCS1 4. VERIFY N1-2 IS IN STANDBY STATE
Node 1: C&DH: MDM N1-2

SECONDARY NCS MDM Node 1
- ✓Frame Count - <incrementing>
'MDM Major State:'
✓MDM State - Standby
✓MDM ID - N1-2
- PCS1 5. COMMAND N1-1 TO SECONDARY. (N1-2 SHOULD GO TO PRIMARY)
Node 1: C&DH: MDM N1-1

PRIMARY NCS MDM Node 1
- NOTE

 1. Sending the following command will cause the loss of PCS1, Early COMM, and OIU telemetry until OIU reconfiguration and PCS2 reconnection are done.
 2. Possible PDI DECOM Fail message.
- 'MDM Major State:'
sel Commands
cmd N1-1_MDM_Xsitn_Second_State Execute
✓Frame Count - <static> (Loss of PCS1 telemetry)
- N1-2 should go to Primary in 20 seconds.
- PCS2 6. TELEMETRY RECOVERY ON PCS2
After boot up when task-bar appears at bottom of display
 sel Arrow directly above 'PCS' logo
 sel Start/Restart PCS CDS
 sel Icon to open PCSCDS Main Control Panel Window
- ✓Status Box is Green and 'Connected' is displayed in the PCS CDS Main Control Panel Window
- NOTE

PCS connection to MDM is indicated by 'Green' in the Status Box and/or 'Connected' message displayed in the PCS CDS Main Control Panel Window.

 * If Status Box is not Green, select 'Connect to MDM' icon *
 * to reconnect.
 * If still no joy, close all displays and all iconified items and *
 * repeat this step.
 *
 * ✓MCC if Status Box is still not green.

7. VERIFY N1-2 IS PRIMARY AND N1-1 IS SECONDARY

PCS2

Node 1: C&DH: MDM N1-2

PRIMARY NCS MDM Node 1

✓Frame Count - <incrementing>

'MDM Major State:'

✓MDM ID - N1-2

✓MDM State - Primary

PCS2

Node 1: C&DH: MDM N1-1

SECONDARY NCS MDM Node 1

✓Frame Count - <incrementing>

'MDM Major State:'

✓MDM ID - N1-1

✓MDM State - Secondary

 * If States are not correct or no N1-2 TLM *
 *
 * ✓MCC *

8. TELEMETRY RECOVERY ON EARLY COMM (GROUND ONLY)

NOTE

Early COMM should reconnect to N1-2 MDM on the other Orb bus automatically in about 10 seconds after N1-2 MDM becomes Primary.

Node 1: C&DH: MDM N1-2

PRIMARY NCS MDM Node 1

✓Frame Count - <incrementing>

'MDM Major State:'

√MDM ID - N1-2
√MDM State - Primary

```
* ****  
* If Frame Count is Static after 20 seconds from the moment      *  
* N1-2 becomes Primary (no Early COMM telemetry received),      *  
*  
* √MCC  
* ****
```

9. TELEMETRY RECOVERY ON OIU

NOTE

Possible PDI DECOM Fail message.

- CRT **SM 212 OIU**
 BUS 3 BC - ITEM 11 EXEC
 BUS 4 RT - ITEM 14 EXEC
 Change OIU N1 Physical Device to N1-2 - ITEM 18 +3 EXEC
- CRT Reload OIU FORMAT 2 - ITEM 1 +2 EXEC
- CRT **SM 210 NODE**
 √PHY ID PRI MDM - N1-2
 √STATE - PRI
 √FAIL - <blank>
 √FRM CTR - <incrementing>

NODE 1 MDM STATE - D. TRANSITIONING N1-2 TO DIAGNOSTIC/OFF FROM STANDBY WHILE N1-1 IS PRIMARY

- PCS1 1. VERIFY MDM STATES AND MDM IDs
Node 1: C&DH: MDM N1-1

PRIMARY NCS MDM Node 1

✓STATE - Primary
✓MDM ID - N1-1

- PCS1 Node 1: C&DH: MDM N1-2

SECONDARY NCS MDM Node 1

✓STATE - Standby
✓MDM ID - N1-2

NOTE

If states are not correct, do not execute this procedure.

✓**MCC**

- PCS1 2. DISABLE NCS AUTO RETRY

Node 1: C&DH: MDM N1-1

PRIMARY NCS MDM Node 1

'Software Control'

sel MDM Utilities

Primary_NCS_MDM_Utils

✓Primary_NCS_Auto_Retry_Inh - X (Inhibited)

If blank (Enable)

sel Commands

cmd Prim_NCS_Inh_NCS_Retry Execute

✓Primary_NCS_Auto_Retry_Inh - X (Inhibited)

- PCS1 3. COMMAND N1-2 TO DIAGNOSTIC

Node 1: C&DH: MDM N1-2

SECONDARY NCS MDM Node 1

'Software Control'

sel MDM FDIR

✓Second_NCS_Cmd_Xsitn_to_Dgnstc_Inh - blank (Enable)

- If X (Inhibited)
 'MDM Major State'
- sel Commands
cmd N1-2_MDM_Cmd_Xsitn_Dgnstc_State_Arm **Execute**
- 'Software Control'
- sel MDM FDIR
 √Second_NCS_Cmd_Xsitn_to_Dgnstc_Inh - blank (Enable)
- 'MDM Major State:'
- sel Commands
cmd N1-2_MDM_Xsitn_Dgnstc_State **Execute**
4. VERIFY N1-2 IS IN DIAGNOSTIC
 PCS1 Node 1: C&DH: MDM N1-2
SECONDARY NCS MDM Node 1
- √Frame Count - <static>
- PCS1 Node 1: C&DH: MDM N1-1
PRIMARY NCS MDM Node 1
 'Software Control'
- sel Transmit Mode Code
- Primary_NCS_Transmit_Mode_Code
- sel Primary NCS Xmt Mode Code Commands
cmd Xmt_Stat_Word_Tmplt
 enter Bus ID - 2
 enter RT Address - 5 **Execute**
- √Subsystem Flag Set - X (Set)
- If Subsystem Flag Bit is set, N1-2 MDM is in Diagnostic State and is ready to accept diagnostic commands.
- If transitioning N1-2 to Diagnostic >>
 If powering off N1-2, go to step 5.

PCS1 5. POWERING OFF N1-2 MDM
 Node 1: C&DH: MDM N1-2
 [SECONDARY NCS MDM Node 1]

'RPCM_N1RS2_C'

sel RPC 13 (Nod1_2_MDM)

[RPCM_N1RS2_C_RPC_13 Detail]

sel Commands
cmd Open **Execute**
√Position - Op

NODE 1 MDM STATE - E. TRANSITIONING N1-1 TO SECONDARY FROM PRIMARY & N1-2 TO PRIMARY FROM STANDBY

- PCS1 1. VERIFY MDM STATES AND MDM IDs

Node 1: C&DH: MDM N1-1

PRIMARY NCS MDM Node 1

✓STATE - Primary

✓MDM ID - N1-1

- PCS1 Node 1: C&DH: MDM N1-2

SECONDARY NCS MDM Node 1

✓STATE - Standby

✓MDM ID - N1-2

NOTE

If states are not correct, do not execute this procedure.

✓MCC

- PCS1 2. COMMAND N1-1 TO SECONDARY. (N1-2 SHOULD GO TO PRIMARY)

Node 1: C&DH: MDM N1-1

PRIMARY NCS MDM Node 1

NOTE

1. Sending the following command will cause the loss of PCS1, Early COMM, and OIU telemetry until OIU reconfiguration and PCS2 reconnection are done.

2. Possible PDI DECOM Fail message.

'MDM Major State:'

sel Commands

cmd N1-1_MDM_Xsitn_Second_State Execute

✓Frame Count - <static> (Loss of PCS1 telemetry)

N1-2 should go to Primary in 20 seconds.

- PCS2 3. TELEMETRY RECOVERY ON PCS2

After boot up, when task-bar appears at bottom of display

sel Arrow directly above 'PCS' logo

sel Start/Restart PCS CDS

sel Icon to open PCS CDS Main Control Panel Window

√Status Box is Green and 'Connected' is displayed in the PCSCDS Main Control Panel Window

NOTE

PCS2 connection to MDM is indicated by 'Green' in the Status Box and/or 'Connected' message displayed in the PCS2 CDS Main Control.

* *****
* If Status Box is not Green, select 'Connect to MDM' icon *
* to reconnect. *
* If still no joy, close all displays and all iconified items and *
* repeat this step. *
* *
* √MCC if Status Box is still not green. *
* *****

4. VERIFY N1-2 IS PRIMARY AND N1-1 IS SECONDARY

PCS2

Node 1: C&DH: MDM N1-2

PRIMARY NCS MDM Node 1

√Frame Count - <incrementing>

'MDM Major State:'

√STATE - Primary
√MDM ID - N1-2

PCS2

Node 1: C&DH: MDM N1-1

SECONDARY NCS MDM Node 1

√Frame Count - <incrementing>

'MDM Major State:'

√STATE - Secondary
√MDM ID - N1-1

* *****
* If States are not correct or no N1-2 TLM, *
* *
* √MCC *
* *****

5. TELEMETRY RECOVERY ON EARLY COMM (GROUND ONLY)

NOTE

Early COMM should reconnect to N1-2 MDM on the other Orb bus automatically in about 10 seconds after N1-2 MDM becomes Primary.

Node 1: C&DH: MDM N1-2

PRIMARY NCS MDM Node 1

✓Frame Count - <incrementing>

'MDM Major State:'

✓MDM ID - N1-2

✓MDM State - Primary

* *****

* If Frame Count is Static after 20 seconds from the moment *

* N1-2 becomes Primary (No Early COMM telemetry received), *

* *

* ✓**MCC** *

* *****

6. TELEMETRY RECOVERY ON OIU

NOTE

Possible PDI DECOM Fail message.

CRT **SM 212 OIU**
 BUS 3 BC - ITEM 11 EXEC
 BUS 4 RT - ITEM 14 EXEC
 Change OIU N1 Physical Device to N1-2 - ITEM 18 +3 EXEC

CRT Reload OIU FORMAT 2 - ITEM 1 +2 EXEC

CRT **SM 210 NODE**
 ✓PHY ID PRI MDM - N1-2
 ✓STATE - PRI
 ✓FAIL - <blank>
 ✓FRM CTR - <incrementing>

NODE 1 MDM STATE - F. TRANSITIONING N1-1 TO OFF/DIAGNOSTIC/ STANDBY FROM PRIMARY & N1-2 TO PRIMARY FROM STANDBY

1. VERIFY MDM STATES

PCS1 Node 1: C&DH: MDM N1-1

PRIMARY NCS MDM Node 1

✓STATE - Primary
✓MDM ID - N1-1

PCS1 Node 1: C&DH: MDM N1-2

SECONDARY NCS MDM Node 1

✓STATE - Standby
✓MDM ID - N1-2

NOTE

If states are not correct, do not execute this procedure.

✓**MCC**

2. DISABLE NCS AUTO RETRY

PCS1 Node 1: C&DH: MDM N1-2

SECONDARY NCS MDM Node 1

'Software Control'

sel MDM Utilities

Primary_NCS_MDM_Utils

✓Secondary_NCS_Auto_Retry_Inh - X (Inhibited)

If blank (Enable)

sel Commands

cmd Second_NCS_Inh_NCS_Retry Execute

✓Secondary_NCS_Auto_Retry_Inh - X (Inhibited)

3. COMMAND N1-1 TO DIAGNOSTIC

PCS1 Node 1: C&DH: MDM N1-1

Primary_NCS_MDM_Utils

'Software Control'

sel MDM FDIR

✓Prim_NCS_Cmd_Xsitn_to_Dgnstc_Inh - <blank> (Enable)

If X (Inhibited)
'MDM Major State'

```
sel Commands
cmd N1-1_MDM_Cmd_Xsitn_Dgnstc_State_Arm Execute
sel MDM FDIR
√Prim_NCS_Cmd_Xsitn_to_Dgnstc_Inh - <blank> (Enable)
```

NOTE

1. Sending the following command will cause the loss of PCS1, Early COMM, and OIU telemetry until OIU reconfiguration and PCS2 reconnection are done.
2. Possible PDI DECOM Fail message.

'MDM Major State:'

```
sel Commands
cmd N1-1_MDM_Xsitn_Dgnstc_State Execute
√Frame Count - <static> (Loss of PCS telemetry)
```

N1-2 should go to Primary State after 20 seconds.

4. **TELEMETRY RECOVERY ON PCS2**
PCS2 After boot up, when task-bar appears at bottom of display
sel Arrow directly above 'PCS' logo
sel Start/Restart PCS CDS
sel Icon to open PCS CDS Main Control Panel Window

√Status Box is Green and 'Connected' is displayed in the PCS2 CDS Main Control Panel Window

NOTE

PCS2 connection to MDM is indicated by 'Green' in the Status Box and/or 'Connected' message displayed in the PCS2 CDS Main Control Panel Window.

```
* ****
* If Status Box is not Green, select 'Connect to MDM' icon *
* to reconnect. *
* If still no joy, close all displays and all iconified items and *
* repeat this step. *
* *
* √MCC if Status Box is still not green. *
* ****
```

5. TELEMETRY RECOVERY ON EARLY COMM (GROUND ONLY)

NOTE

Early COMM should reconnect to N1-2 MDM on the other Orb bus automatically in about 10 seconds after N1-2 MDM becomes Primary.

Node 1: C&DH: MDM N1-2

PRIMARY NCS MDM Node 1

✓Frame Count - <incrementing>

'MDM Major State:'

✓MDM ID - N1-2

✓MDM State - Primary

* *****

* If Frame Count is Static after 20 seconds from the moment *

* N1-2 becomes Primary (No Early COMM telemetry received), *

*

* ✓**MCC** *

* *****

6. TELEMETRY RECOVERY ON OIU

NOTE

Possible PDI DECOM Fail message.

CRT **SM 212 OIU**
 BUS 3 BC - ITEM 11 EXEC
 BUS 4 RT - ITEM 14 EXEC
 Change OIU N1 Physical Device to N1-2 - ITEM 18 +3 EXEC

CRT Reload OIU FORMAT 2 - ITEM 1 +2 EXEC

CRT **SM 210 NODE**
 ✓PHY ID PRI MDM - N1-2
 ✓STATE - PRI
 ✓FAIL - <blank>
 ✓FRM CTR - <incrementing>

7. VERIFY N1-2 IS PRIAMRY AND N1-1 IS IN DIAGNOSTIC

PCS2 Node 1: C&DH: MDM N1-1
SECONDARY NCS MDM Node 1

✓Frame Count - <static>

- PCS2 Node 1: C&DH: MDM N1-2
 PRIMARY NCS MDM Node 1
- √Frame Count - <incrementing>
- 'MDM Major State:'
- √STATE - Primary
 √MDM ID - N1-2
- sel Transmit Mode Code
- Primary_NCS_Transmit_Mode_Code
- sel 'Primary NCS Xmt Mode Code Commands'
cmd Xmt_Stat_Word_Tmplt
 enter Bus ID - 2
 enter RT Address - 6 **Execute**
- √Subsystem Flag Set - X (Set)
- If Subsystem Flag Bit is set, N1-1 MDM is in Diagnostic State and is ready to accept diagnostic commands.
- If transitioning N1-1 to Diagnostic >>
 If powering off N1-1, go to step 8.
 If transitioning N1-1 to Standby, go to step 9.
8. **POWERING OFF N1-1 MDM**
- PCS2 Node 1: C&DH: MDM N1-1
 SECONDARY NCS MDM Node 1
- 'RPCM _N1RS1_A'
- sel RPC 11 (Nod1_1_MDM)
- RPCM _N1RS2_A_RPC_11 Detail
- √Position - Cl
 sel Commands
cmd Open **Execute**
 √Position - Op
- If powering N1-1 off >>

PCS2 9. TRANSITIONING N1-1 TO STANDBY STATE

Node 1: C&DH: MDM N1-2

PRIMARY NCS MDM Node 1

'Software Control'

sel MDM Utilities

sel Commands

NOTE

1. Startup process will execute from the UAS currently loaded in DRAM.
2. No POST is performed.

cmd N1_1_MDM_Re_Init_MDM_DRAM Execute

Wait 60 seconds for MDM to reinitialize.

PCS2 Node 1: C&DH: MDM N1-1

SECONDARY NCS MDM Node 1

✓Frame Count - <incrementing>

'MDM Major State:'

✓STATE - Standby

✓MDM ID - N1-1

* If state is not Standby, *

* *

* ✓**MCC** *

NODE 1 MDM STATE - G. TRANSITIONING N1-1 TO OFF/DIAGNOSTIC/ STANDBY FROM SECONDARY WHILE N1-2 IS PRIMARY

1. VERIFY MDM STATES

PCS2 Node 1: C&DH: MDM N1-2

PRIMARY NCS MDM Node 1

✓STATE - Primary
✓MDM ID - N1-2

PCS2 Node 1: C&DH: MDM N1-1

SECONDARY NCS MDM Node 1

✓STATE - Secondary
✓MDM ID - N1-1

NOTE

If states are not correct, do not execute this procedure.

✓**MCC**

If transitioning N1-1 to Standby, go to step 2.

If transitioning N1-1 to Diagnostic or powering N1-1 off, go to step 3.

2. TRANSITIONING TO STANDBY STATE

PCS2 Node 1: C&DH: MDM N1-1

SECONDARY NCS MDM Node 1

'MDM Major State:'

sel Commands
cmd Second_NCS_Xsitn_Stby_State Execute
✓N1-1 MDM State - Standby

If transitioning N1-1 to Standby >>

3. DISABLE NCS AUTO RETRY

PCS2 Node 1: C&DH: MDM N1-2

PRIMARY NCS MDM Node 1

'Software Control'

sel MDM Utilities

Primary_NCS_MDM_Utils

✓Primary_NCS_Auto_Retry_Inh - X (Inhibited)

- If blank (Enable)
 sel Commands
cmd Primary_NCS_Inh_NCS_Retry Execute
 √Primary_NCS_Auto_Retry_Inh - X (Inhibited)
- PCS2 4. TRANSITIONING N1-1 TO DIAGNOSTIC
 Node 1: C&DH: MDM N1-1
SECONDARY NCS MDM Node 1
 'Software Control'
- sel MDM FDIR
 √Second_MDM_Cmd_Xsitn_to_Dgnstc_Inh - <blank> (Enable)
- If X (Inhibited)
 'MDM Major State:'
- sel Commands
cmd N1-1_MDM_Cmd_Xsitn_Dgnstc_State_Arm Execute
 'Software Control'
- sel MDM FDIR
 √Second_MDM_Cmd_Xsitn_to_Dgnstc_Inh - <blank> (Enable)
- 'MDM Major State:'
- sel Commands
cmd N1-1_MDM_Xsitn_Dgnstc_State Execute
- If transitioning N1-1 to Diagnostic >>
 If powering N1-1 off, go to step 5.
- PCS2 5. POWERING OFF N1-1 MDM
 Node 1: C&DH: MDM N1-1
SECONDARY NCS MDM Node 1
 'RPCM _N1RS1_A'
- sel RPC 11 (Nod1_1_MDM)
- RPCM _N1RS1_A_RPC_11 Detail
- √Position - Cl
 sel Commands
cmd Open Execute
 √Position - Op

NODE 1 MDM STATE - I. TRANSITIONING N1-1 TO SECONDARY FROM OFF/DIAGNOSTIC/STANDBY WHILE N1-2 IS PRIMARY

- PCS2 1. VERIFY MDM STATE

Node 1: C&DH: MDM N1-2

PRIMARY NCS MDM Node 1

✓STATE - Primary

✓MDM ID - N1-2

If N1-1 is Off, go to step 2.

If N1-1 is in Diagnostic state, go to step 3.

If N1-1 is in Standby state, go to step 5.

- PCS2 2. IF N1-1 IS INITIALLY OFF, BRING IT TO STANDBY

Node 1: C&DH: MDM N1-1

SECONDARY NCS MDM Node 1

'RPCM_N1RS1_A'

sel RPC 11 (Nod1_1_MDM)

RPCM_N1RS1_A_RPC_11 Detail

✓Position - Op

sel Commands

cmd Close **Execute**

✓Position - Cl

Wait at least 90 seconds for MDM to start up, finish POST, and go to Standby.

Go to step 4.

- PCS2 3. IF N1-1 IS INITIALLY IN DIAGNOSTIC STATE, BRING IT TO STANDBY

Node 1: C&DH: MDM N1-1

SECONDARY NCS MDM Node 1

✓Frame Count - <static>

- PCS2 Node 1: C&DH: MDM N1-2

PRIMARY NCS MDM Node 1

'Software Control'

sel Transmit Mode Code

Primary_NCS_Transmit_Mode_Code

sel Primary NCS Xmt Mode Code Commands
cmd Xmt_Stat_Word_Tmplt
enter Bus ID - 2
enter RT Address - 6 **Execute**

√Subsystem Flag Set - X (set)

If Subsystem Flag Bit is set, N1-2 MDM is in Diagnostic State and is ready to accept diagnostic commands.

PCS2 Node 1: C&DH: MDM N1-1

PRIMARY NCS MDM Node 1

'Software Control'

sel MDM Utilities
sel Commands

NOTE

1. Check with **MCC** for which command to send (reinit from DRAM or EEPROM).
2. For DRAM Reinitialization
Startup process will execute from the UAS currently loaded in DRAM.
No POST is performed.
3. For EEPROM Reinitialization
Reinitialize MDM from EEPROM will cause the loss of all current information in the DRAM such as BST, current Bus, RT, and application configuration.
All UAS and default Configuration Tables will be loaded from EEPROM.
Normal POST will be performed.

If reinitialize from DRAM

| **cmd** N1_1_MDM_Re_Init_MDM_DRAM **Execute**

If reinitialize from EEPROM

cmd N1_1_MDM_Re_Init_MDM_EEPROM **Execute**

Wait 60 seconds for MDM to reinitialize.

4. VERIFY N1-1 IS IN STANDBY STATE

PCS2 Node 1: C&DH: MDM N1-1

SECONDARY NCS MDM Node 1

√Frame Count - <incrementing>

'MDM Major State:'

$\sqrt{N1-1}$ MDM State - Standby
 $\sqrt{MDM\ ID}$ - N1-1

* If state is not Standby, *
* *
* \sqrt{MCC} *

PCS2 5. COMMAND N1-1 TO SECONDARY

Node 1: C&DH: MDM N1-1

SECONDARY NCS MDM Node 1

'MDM Major State:'

sel Commands
cmd N1-1_MDM_Xsitn_Second_State Execute

PCS2 6. VERIFY N1-1 IS SECONDARY

Node 1: C&DH: MDM N1-1

SECONDARY NCS MDM Node 1

$\sqrt{Frame\ Count}$ - <incrementing>

'MDM Major State:'

$\sqrt{MDM\ State\ -\ Secondary}$
 $\sqrt{MDM\ ID\ -\ N1-1}$

* If state is not correct, *
* *
* \sqrt{MCC} *

NODE 1 MDM STATE - J. TRANSITIONING N1-1 TO OFF/DIAGNOSTIC FROM STANDBY WHILE N1-2 IS PRIMARY

1. VERIFY MDM STATES

PCS2 Node 1: C&DH: MDM N1-2

PRIMARY NCS MDM Node 1

✓STATE - Primary
✓MDM ID - N1-2

PCS2 Node 1: C&DH: MDM N1-1

SECONDARY NCS MDM Node 1

✓STATE - Standby
✓MDM ID - N1-1

NOTE

If states are not correct, do not execute this procedure.

✓**MCC**

2. DISABLE NCS AUTO RETRY

PCS2 Node 1: C&DH: MDM N1-2

PRIMARY NCS MDM Node 1

'Software Control'

sel MDM Utilities

Primary_NCS_MDM_Utils

✓Primary_NCS_Auto_Retry_Inh - X (Inhibited)

If blank (Enable)

sel Commands

cmd Primary_NCS_Inh_NCS_Retry Execute

✓Primary_NCS_Auto_Retry_Inh - X (Inhibited)

3. COMMAND N1-1 TO DIAGNOSTIC

PCS2 Node 1: C&DH: MDM N1-1

SECONDARY NCS MDM Node 1

'Software Control'

sel MDM FDIR

✓Second_NCS_Cmd_Xsitn_to_Dgnstc_Inh - <blank> (Enable)

If X (inhibited)
‘MDM Major State:’

sel Commands
cmd N1-1_MDM_Cmd_Xsitn_Dgnstc_State_Arm Execute

‘Software Control’

sel MDM FDIR
√Second_NCS_Cmd_Xsitn_to_Dgnstc_Inh - <blank> (Enable)

‘MDM Major State:’

sel Commands
cmd N1-1_MDM_Xsitn_Dgnstc_State Execute

4. VERIFY N1-1 IS IN DIAGNOSTIC

PCS2 Node 1: C&DH: MDM N1-1

SECONDARY NCS MDM Node 1

√Frame Count - <static>

PCS2 Node 1: C&DH: MDM N1-2

PRIMARY NCS MDM Node 1

sel Transmit Mode Code

Primary_NCS_Transmit_Mode_Code

sel Primary NCS Xmt Mode Code Commands
cmd Xmt_Stat_Word_Tmplt
enter Bus ID - 2
enter RT Address - 6 **Execute**

√Subsystem Flag Set - X (Set)

If Subsystem Flag Bit is set, N1-2 MDM is in Diagnostic State and is ready to accept diagnostic commands.

If transitioning N1-1 to Diagnostic >>
If powering N1-1 off, go to step 5.

PCS1 5. POWERING OFF N1-1 MDM
 Node 1: C&DH: MDM N1-1
 SECONDARY NCS MDM Node 1

'RPCM _N1RS1_A'

sel RPC 11 (Nod1_1_MDM)

RPCM _N1RS1_A_RPC_11 Detail

sel Commands
cmd Open **Execute**

√Position - Op

MALFUNCTION PROCEDURES

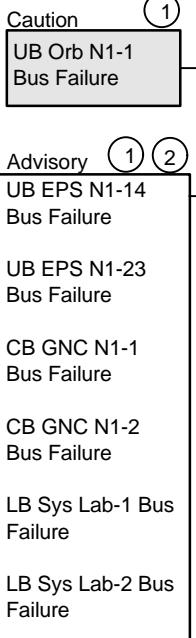
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PRIME NCS DETECTED RT FAIL MDM FGB-2(1) - FGB	2-21
PVCU FAIL	TBD

MALFUNCTION

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C&DH

CAUTION
ALARM



Nominal Config:

Comm via Early COMM or OIU

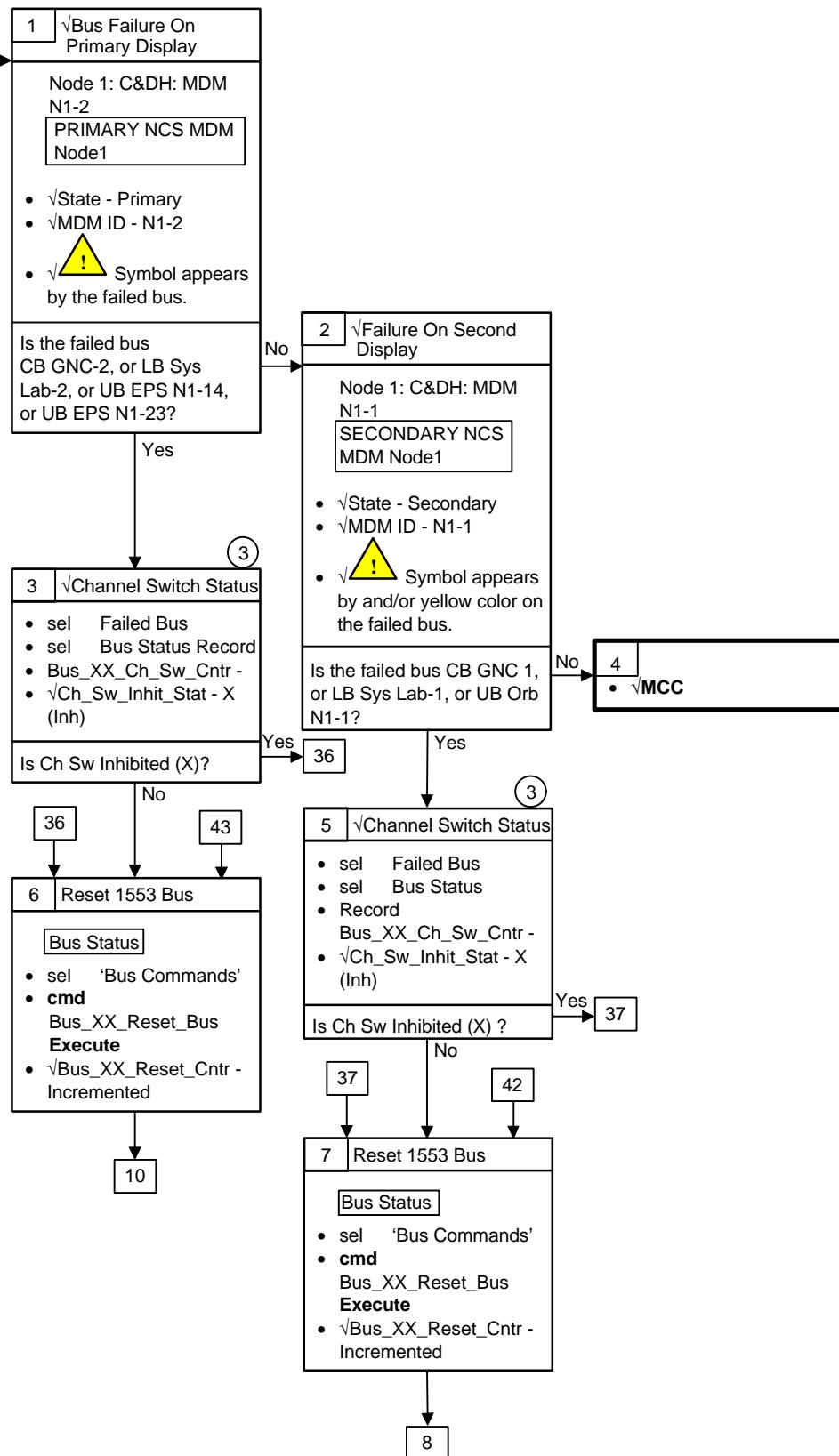
N1-2 State = Prim
N1-1 State = Second

Active Tlm Sink = FGB

Auto Retry = Ena

Bus FDIR = Ena

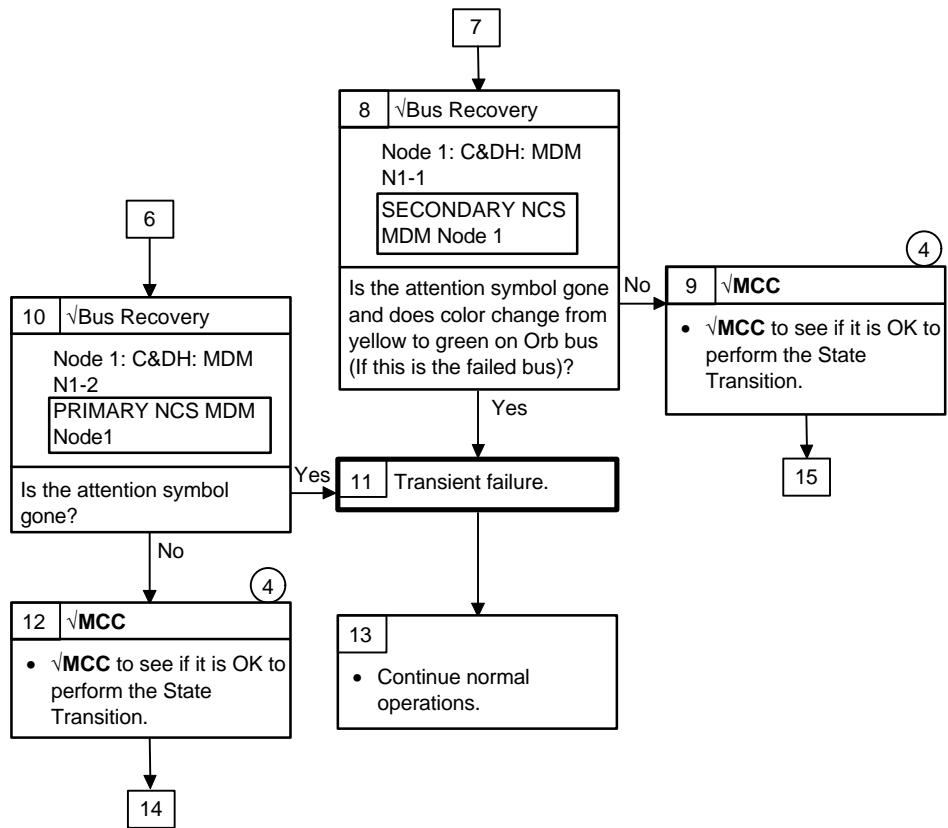
1553 BUS FAILURE



(1) UB Orb_N1-1 is the only bus that generates this caution message. However, this bus only has a few RTs on it: OIU 1 and 2 (not always present), 4 CBMs (usually off), and FGB 1 and 2 (only one is active on the Primary MDM). So, most of the time, there is no I/O on the bus; hence, there is no caution message generated (no bus failure). In addition, there are cases with only one RT on the bus. In these cases, the failure of the RT itself will also cause the bus to fail. Only the caution and warning messages generate the yellow color on the jailed bus.

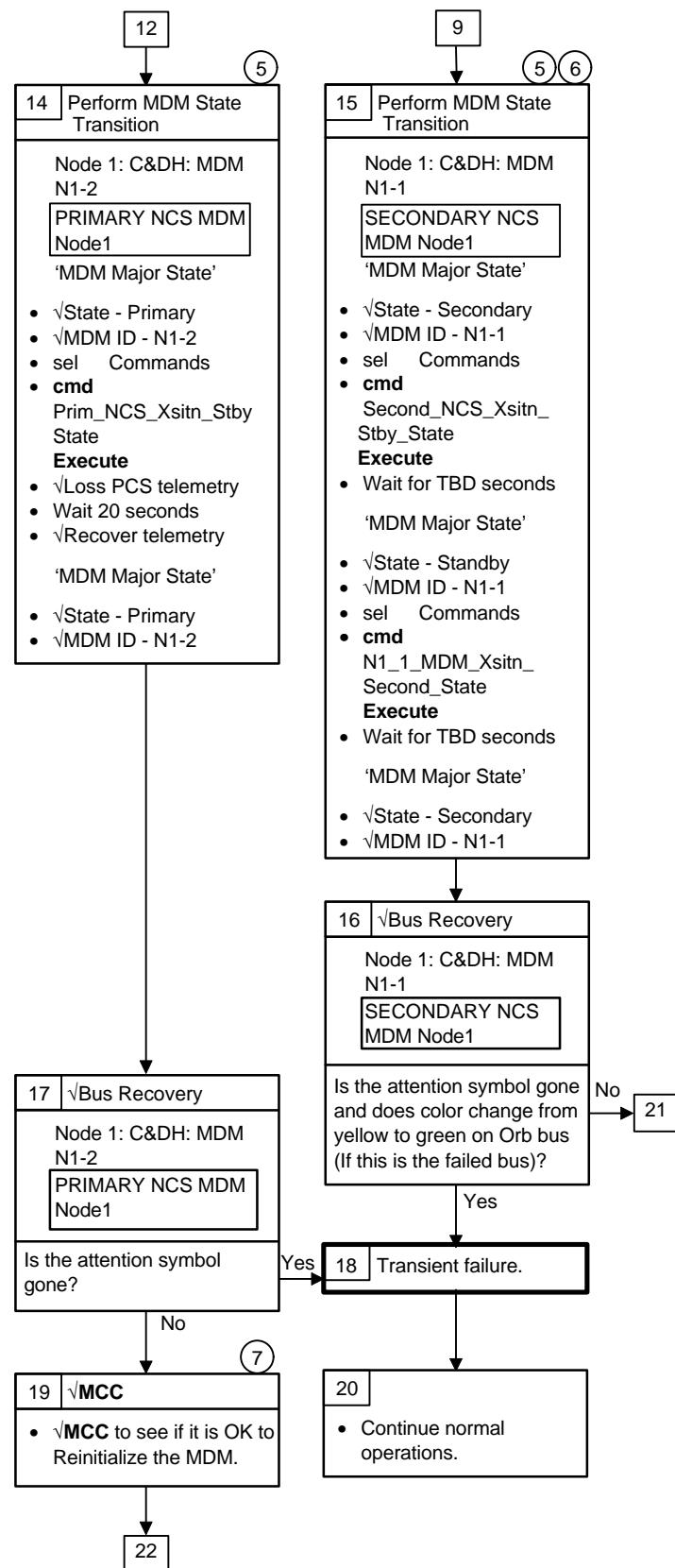
(2) GNC-2 bus has only two RTs on it: N1-1 MDM and a CBM (usually off). GNC-1 only has one CBM (usually off).

(3) "Bus_XX_" is the Ops name of the actual failed bus (e.g. CB GNC_2). The "Bus_XX_", nevertheless, has to be one of the buses in the box right above this box (1 or 2).



4 MDM state transition will affect all other space station subsystems connected to that MDM. Make sure that all other disciplines agree with the execution of this step.

1553 BUS FAILURE (Cont)



(5)

Transitioning the MDM from one state to another will reset the bus configuration and may fix the failure. The steps in this box are not the same as those in the MDM Reconfiguration procedure where we put the MDM in new state permanently. The N1-2 MDM will not stay in the new state permanently here. It will go back to Primary state after 20 seconds in standby automatically.

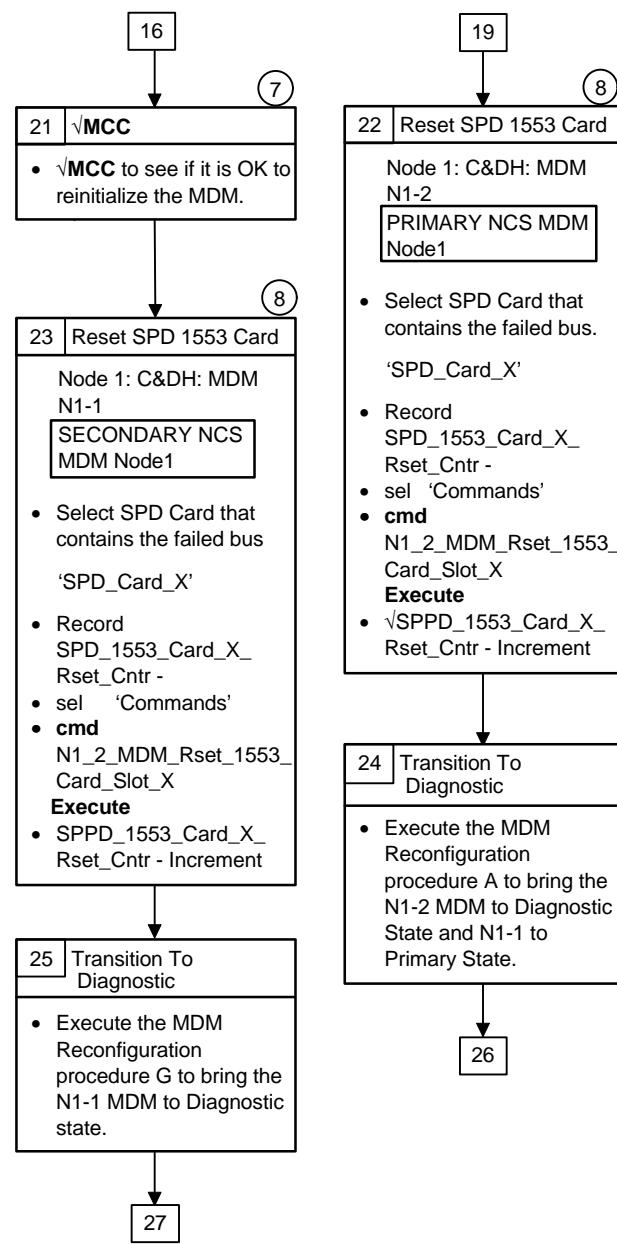
(6)

N1-1 MDM will not go back to Secondary state automatically. It has to be commanded.

(7)

Reinitializing the MDM will affect the operation of the entire MDM which will affect all other subsystems. Make sure that all other disciplines agree with the execution of this step. PCS connected to N1-1 is required.

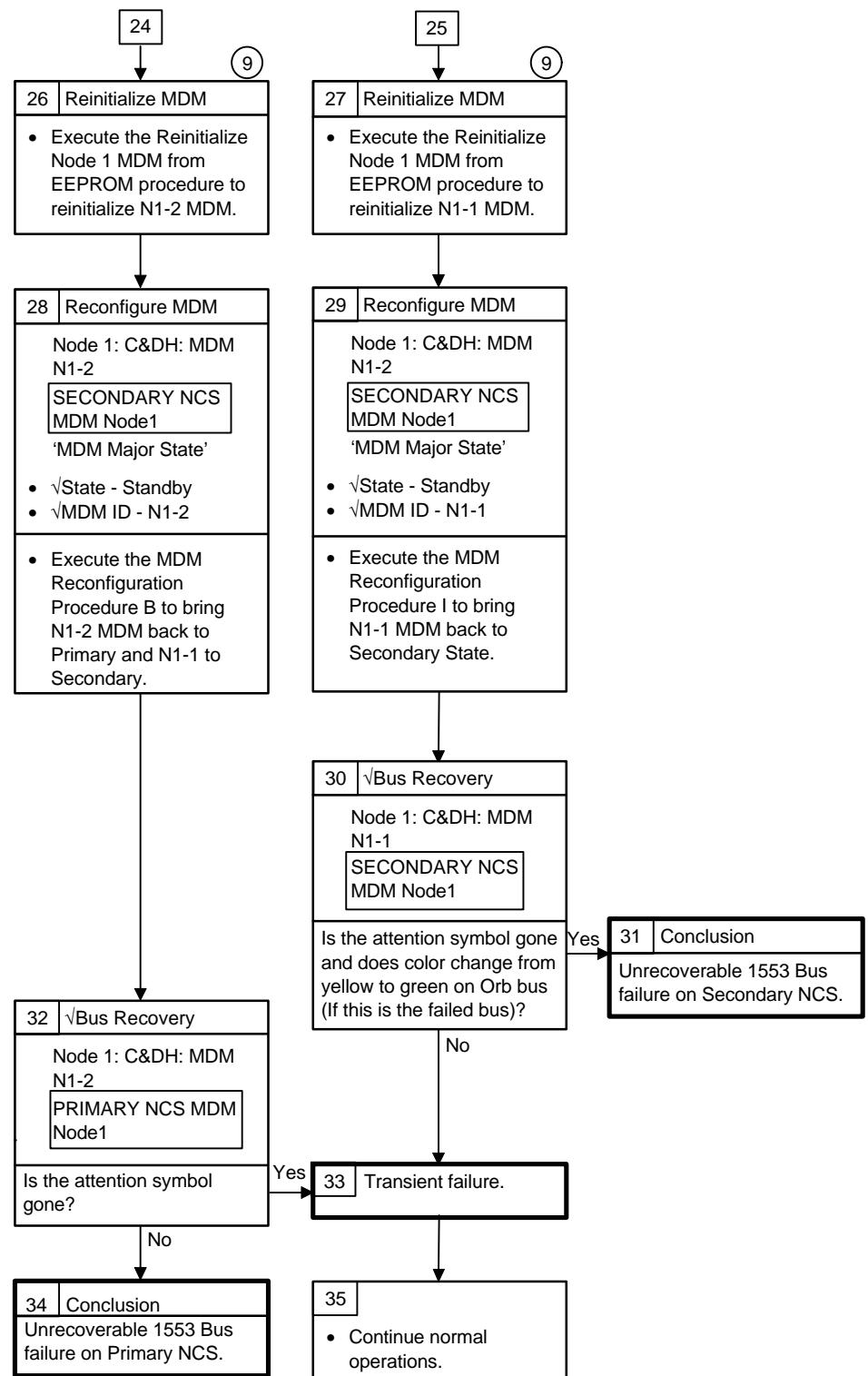
1553 BUS FAILURE (Cont)



(7) Reinitializing the MDM will affect the operation of the entire MDM which will affect all other subsystems. Make sure that all other disciplines agree with the execution of this step. PCS connected to N1-1 is required.

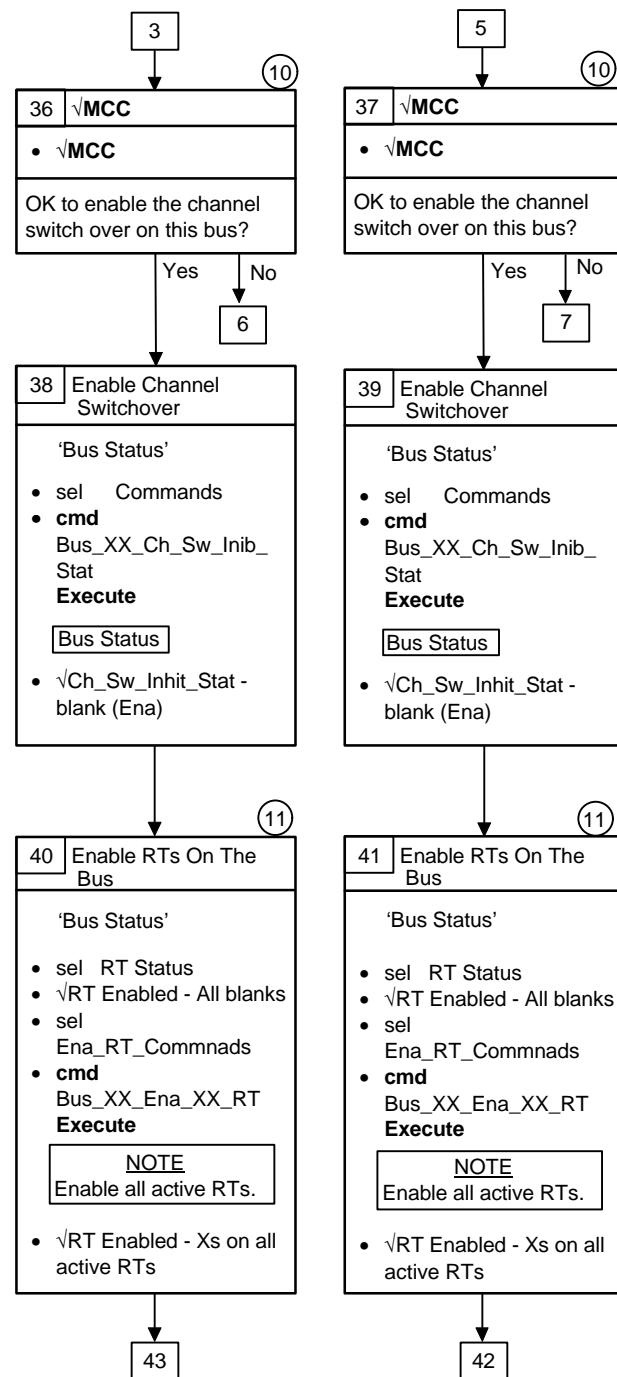
(8) Resetting the SPD 1553 Card will not reestablish I/O on the buses. So, resetting the SPD Card and reinitializing the MDM is actually one single action in the attempt to recover the bus failure.

X = 0 for SPD 0.
X = 1 for SPD 1.

1553 BUS FAILURE (Cont)

(9)
Reinitializing the MDM from EEPROM will clear the station old configuration.

1553 BUS FAILURE (Cont)

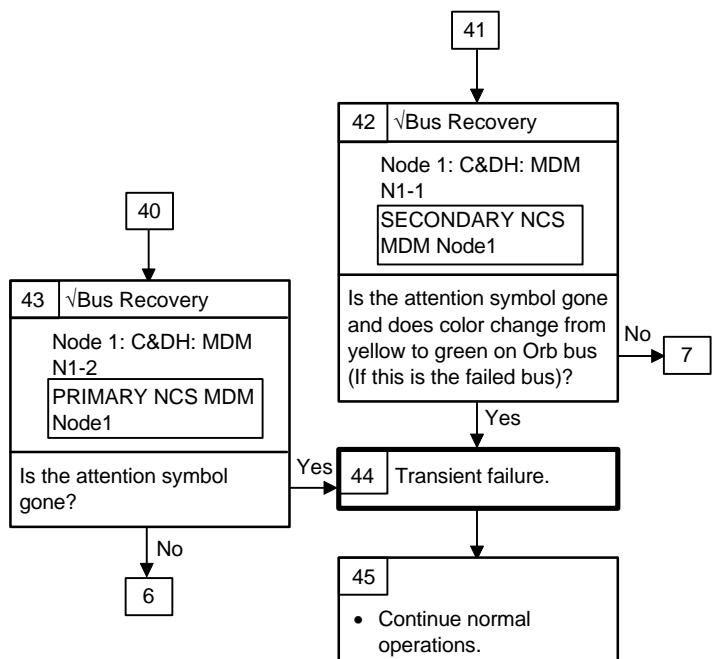


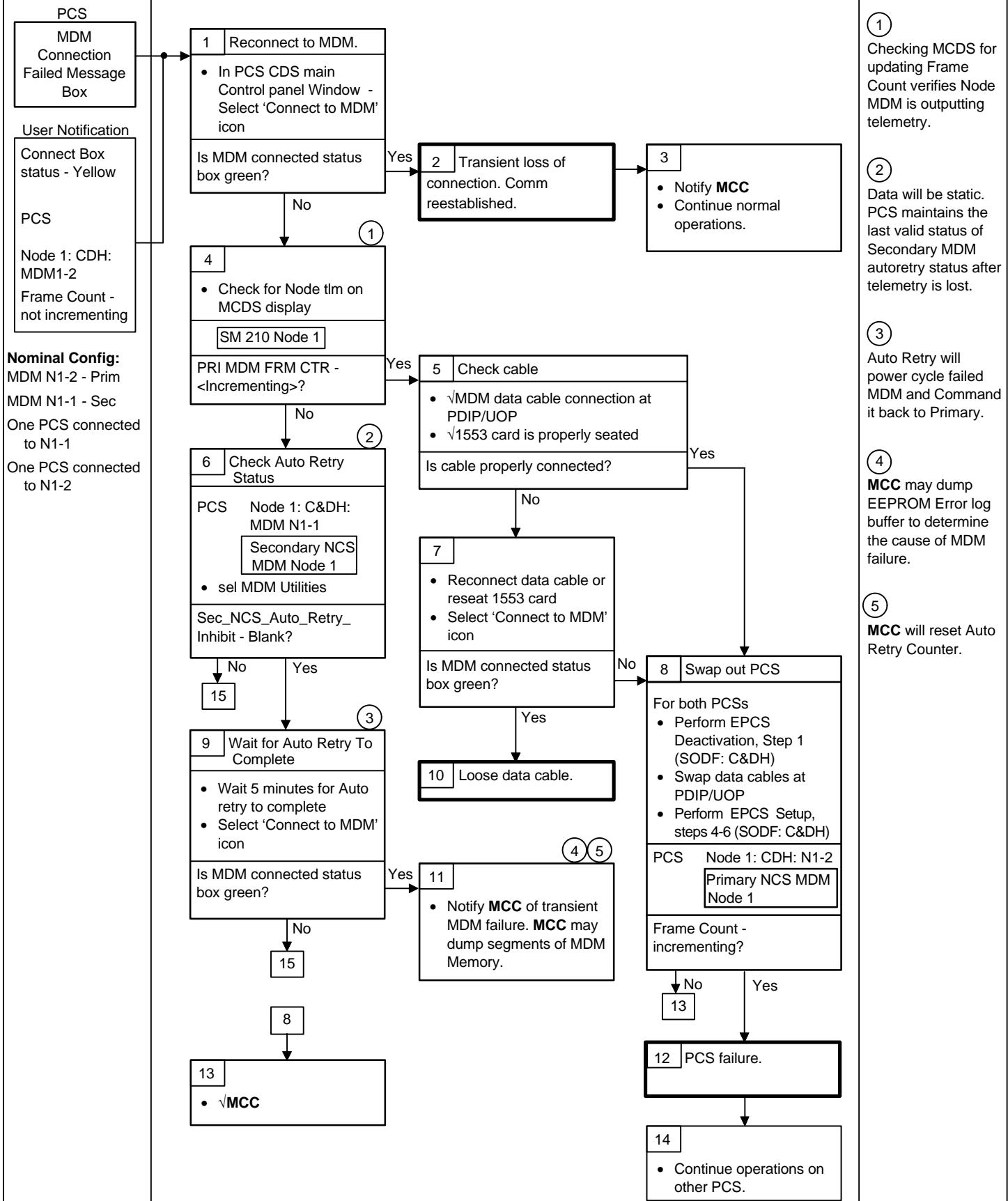
(10)

The Auto switchover must have been inhibited for a reason. It is necessary to make sure that there are no critical functions being performed on the other channel that may be hazardous if enabled.

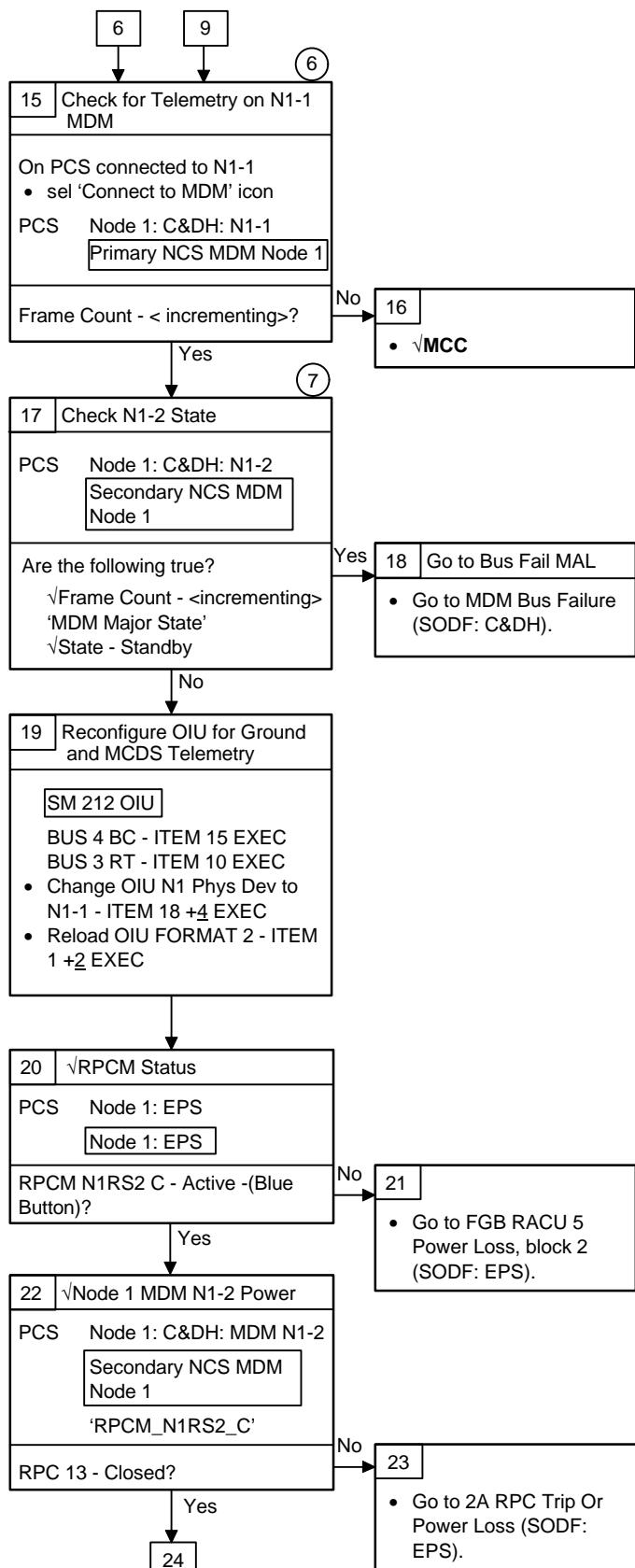
(11)

Before the bus is declared fail, every single RT on the bus has to fail. The RTs on the failed bus are disabled prior to setting the bus failure flag bit. The RTs will have to be re-enabled to be able to see if the bus works on the other channel. Use the RT # to RT Ops Names Matrix to enable the active RTs on this bus.

1553 BUS FAILURE (Cont)

C&DH**LOSS OF PCS TELEMETRY**

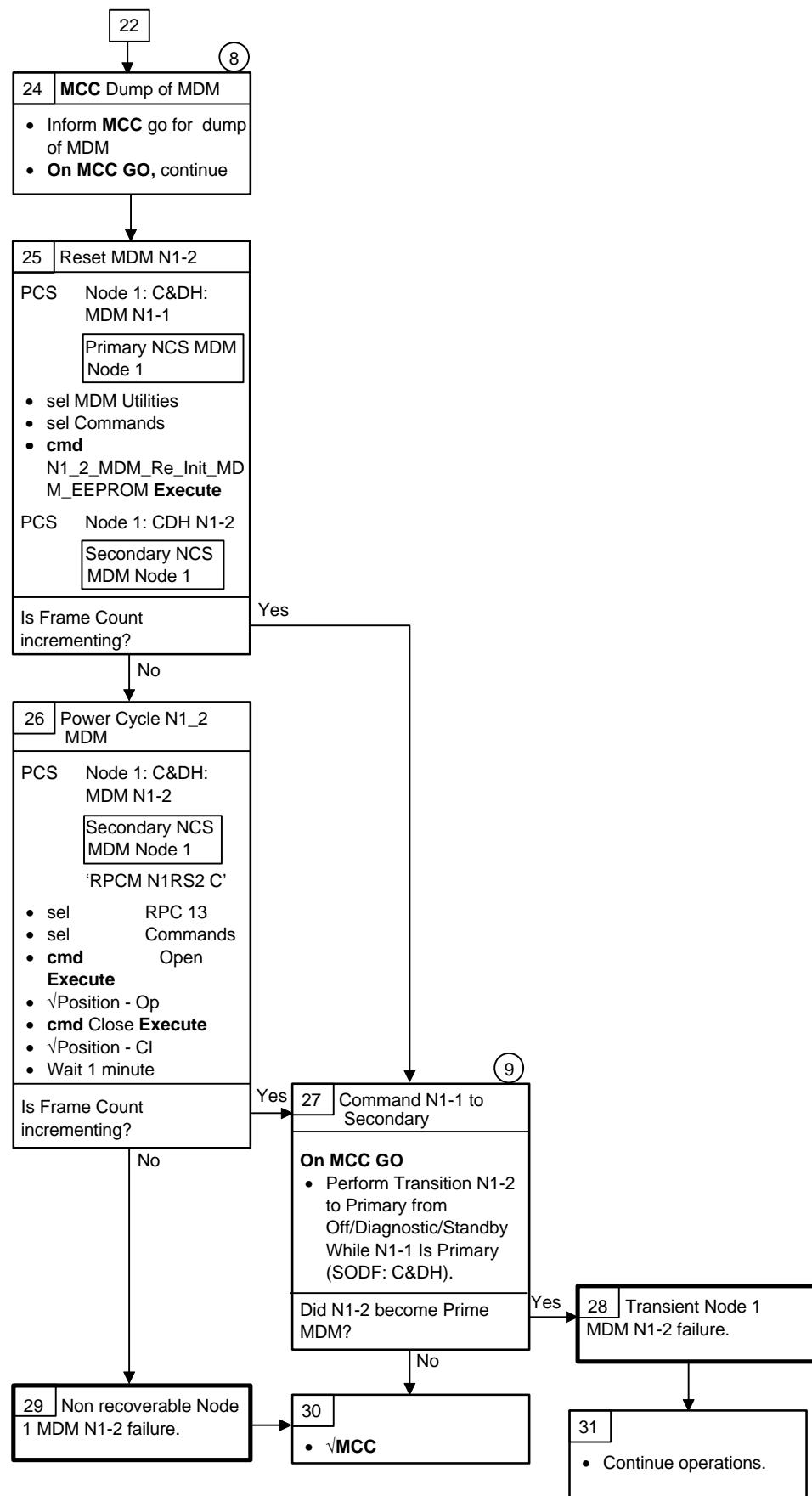
LOSS OF PCS TELEMETRY (Cont)



⑥ If N-2 has failed,
N1-1 will
automatically take
over as primary.

(7)
If UB Orb N1-2 Bus fails, N-2 will command itself to standby and wait longer than normal allowing N1-1 to become primary MDM.

LOSS OF PCS TELEMETRY (Cont)

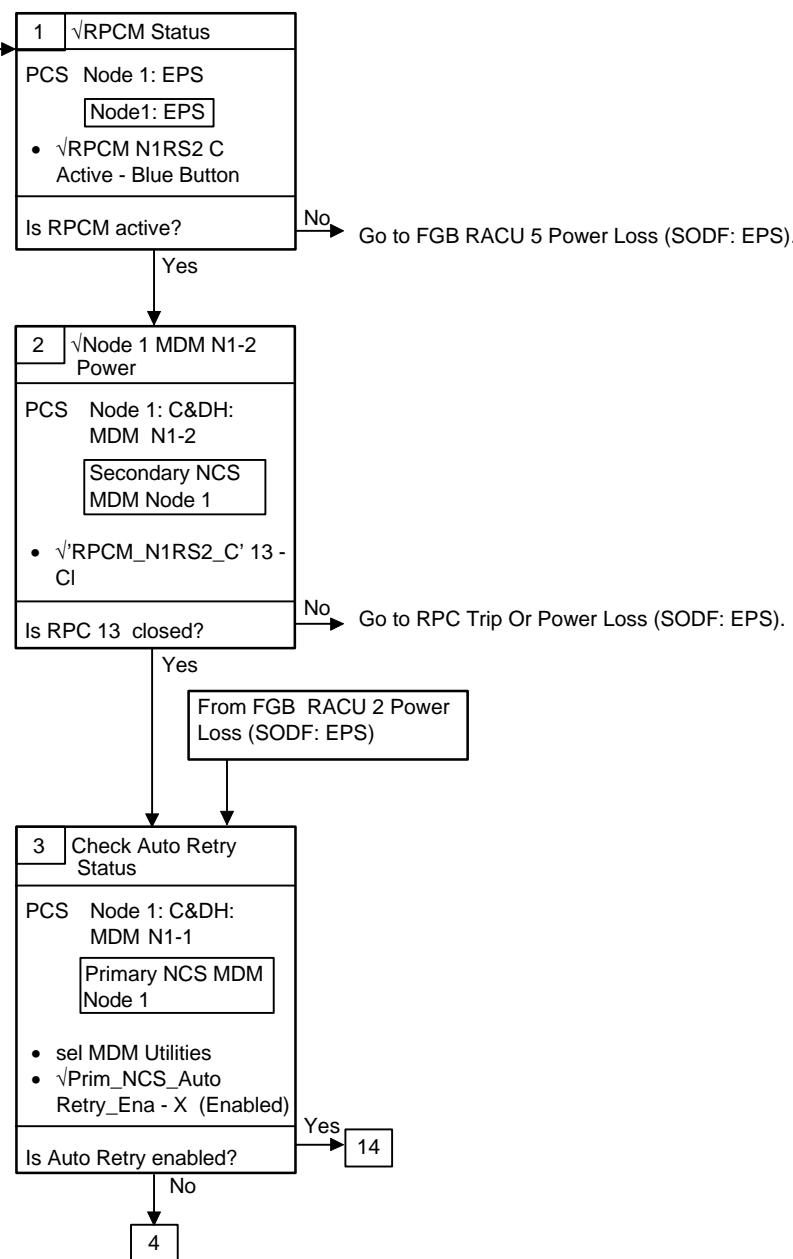


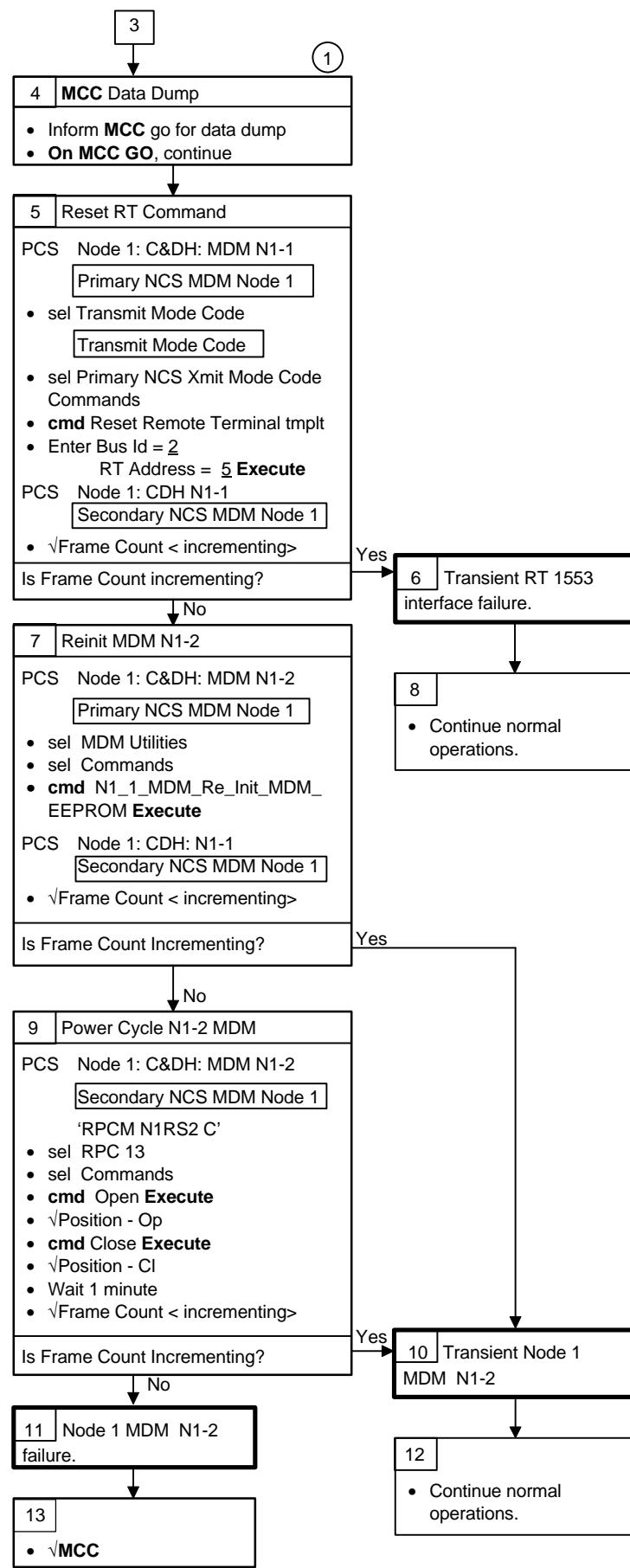
C&DH**MDM N1-1 DETECTED RT FAIL MDM N1-2 - PMA 1**

CAUTION ALARM

MDM N1-1
Detected RT Fail
MDM N1-2 -
PMA 1

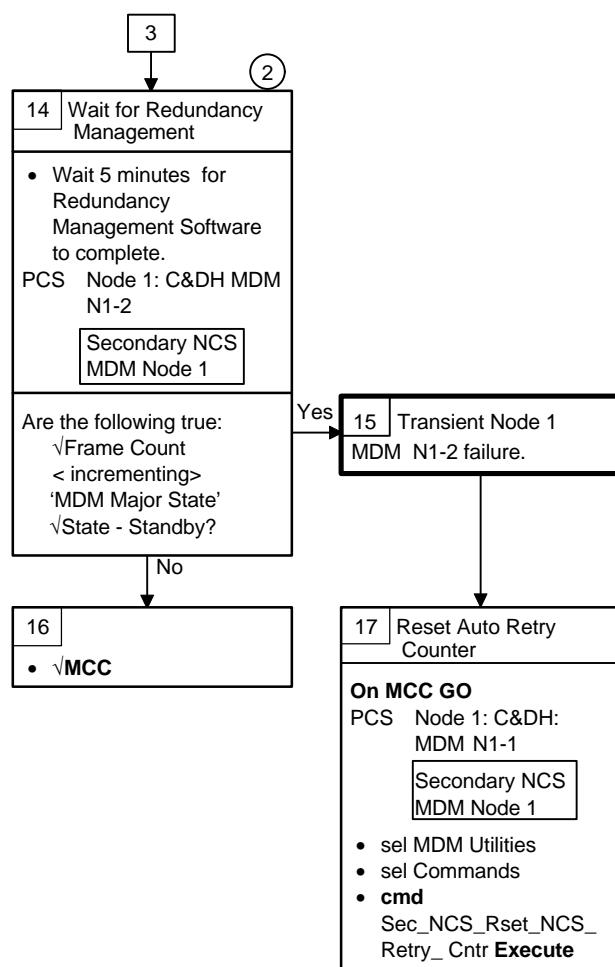
Nominal Config:
N1-2 Secondary
N1-1 Primary



MDM N1-1 DETECTED RT FAIL MDM N1-2 - PMA 1 (Cont)

(1) MCC may dump all or part of MDM Memory to determine source of the failure.

C&DH

MDM N1-1 DETECTED RT FAIL MDM N1-2 - PMA 1 (Cont)

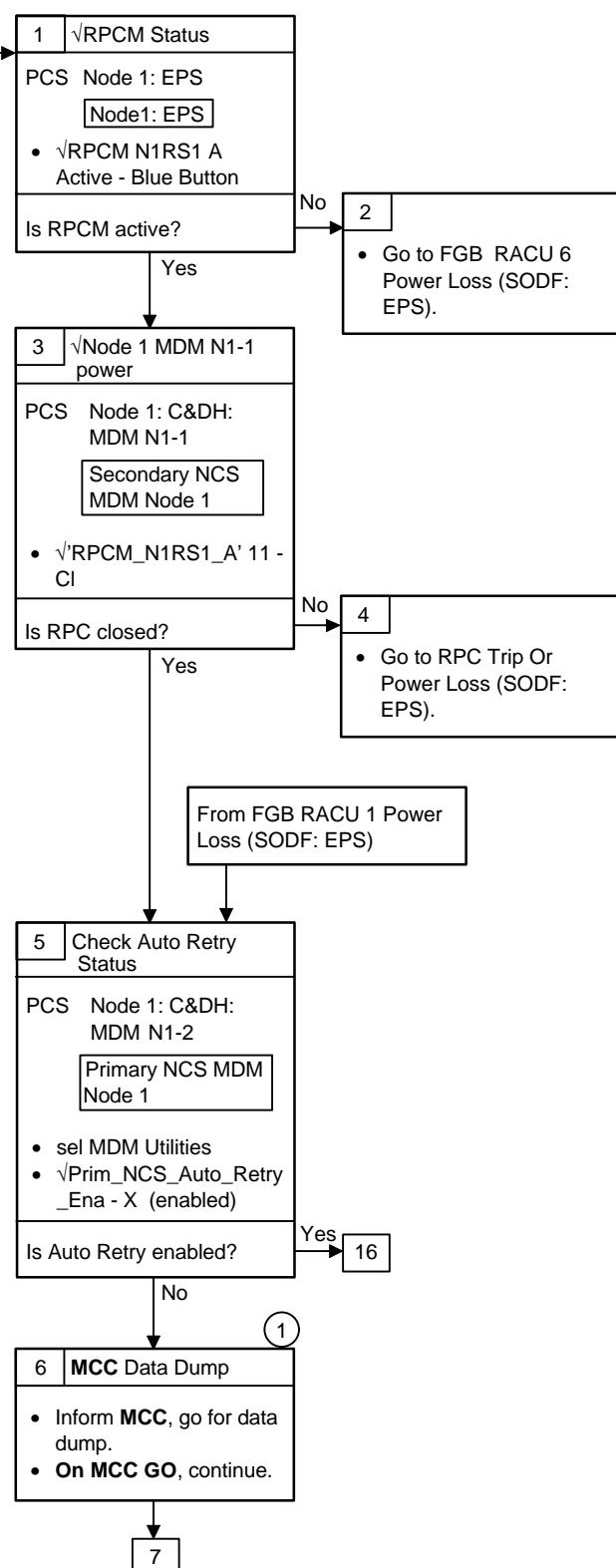
(2)
 Auto Retry will power cycle MDM N1-2.

C&DH**MDM N1-2 DETECTED RT FAIL MDM N1-1 - PMA 1**

CAUTION
ALARM

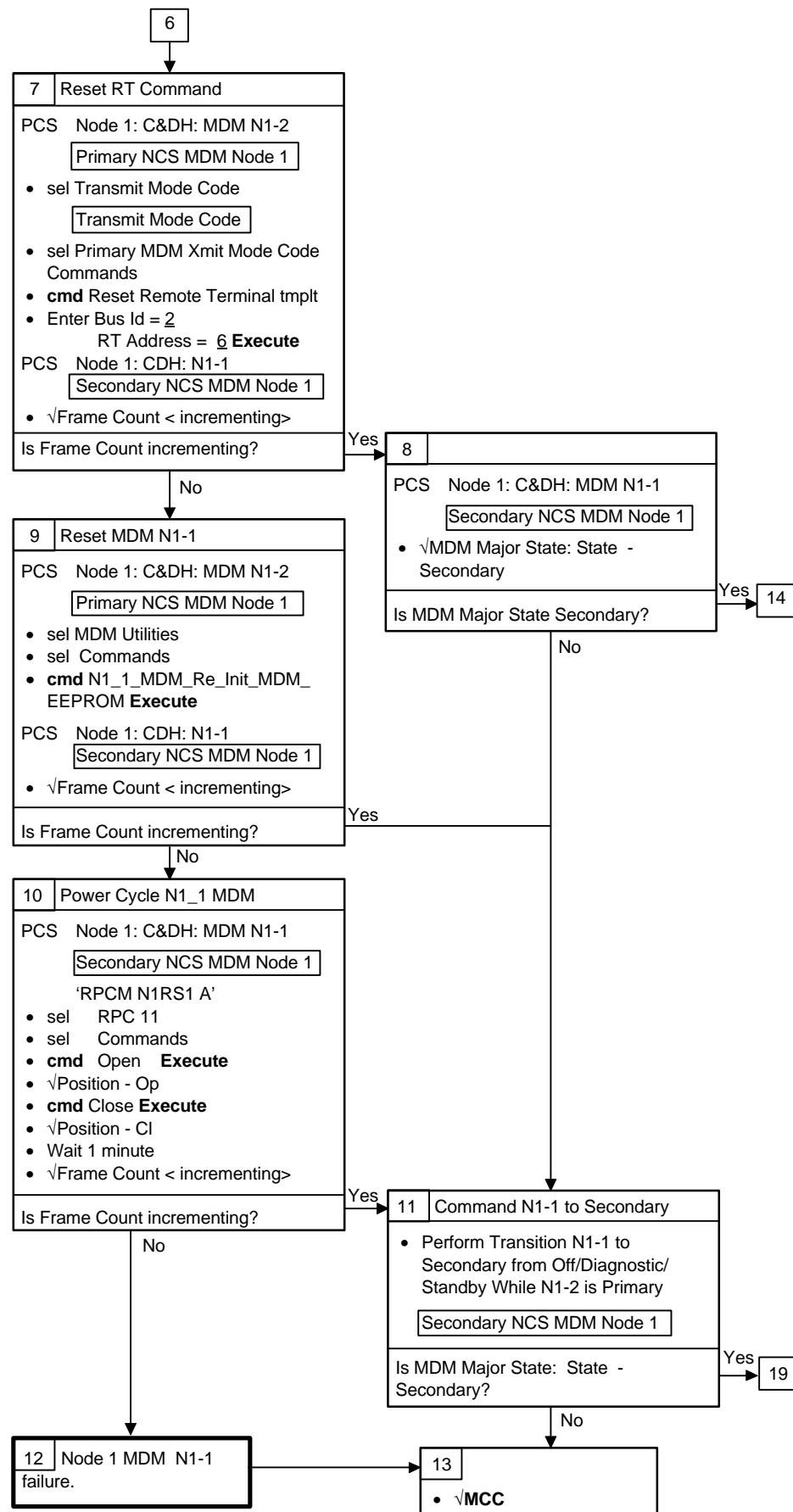
MDM N1-2
Detected RT Fail
MDM N1-1 -
PMA 1

Nominal Config:
N1-2 Primary
N1-1 Secondary

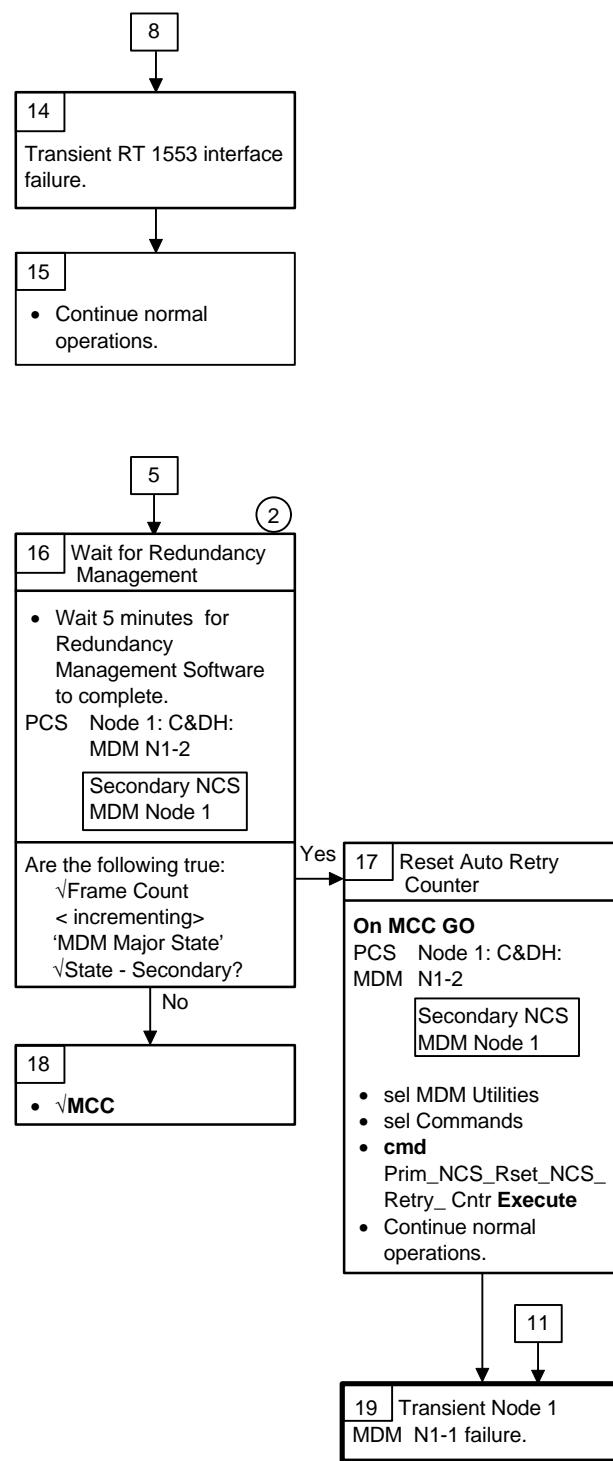


(1)

MCC may dump all or part of MDM Memory to determine source of the failure.

MDM N1-2 DETECTED RT FAIL MDM N1-1 - PMA 1 (Cont)

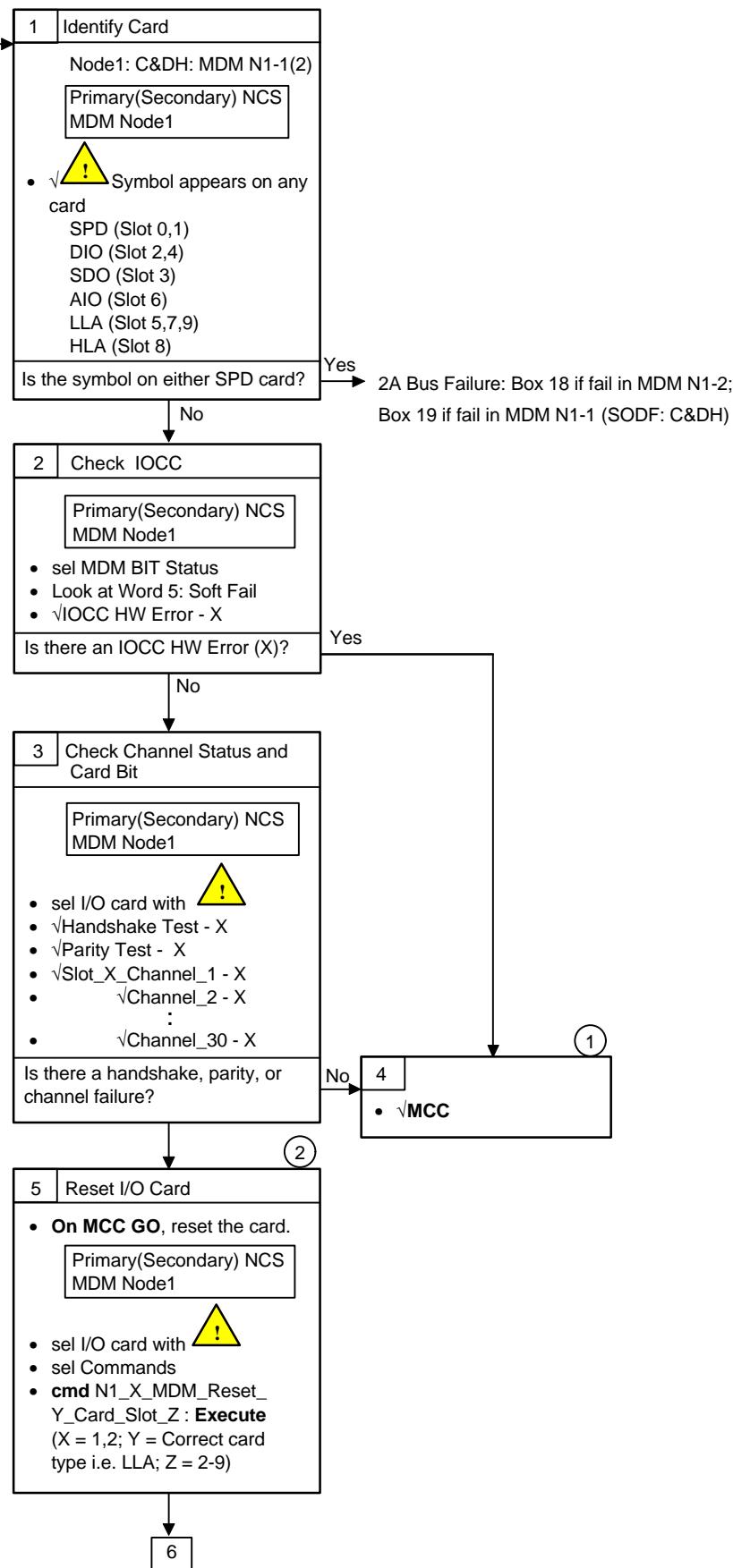
(2)
Auto Retry will power cycle MDM N1-1 and command it to secondary.



C&DH**NODE 1 MDM I/O CARD FAILURE**

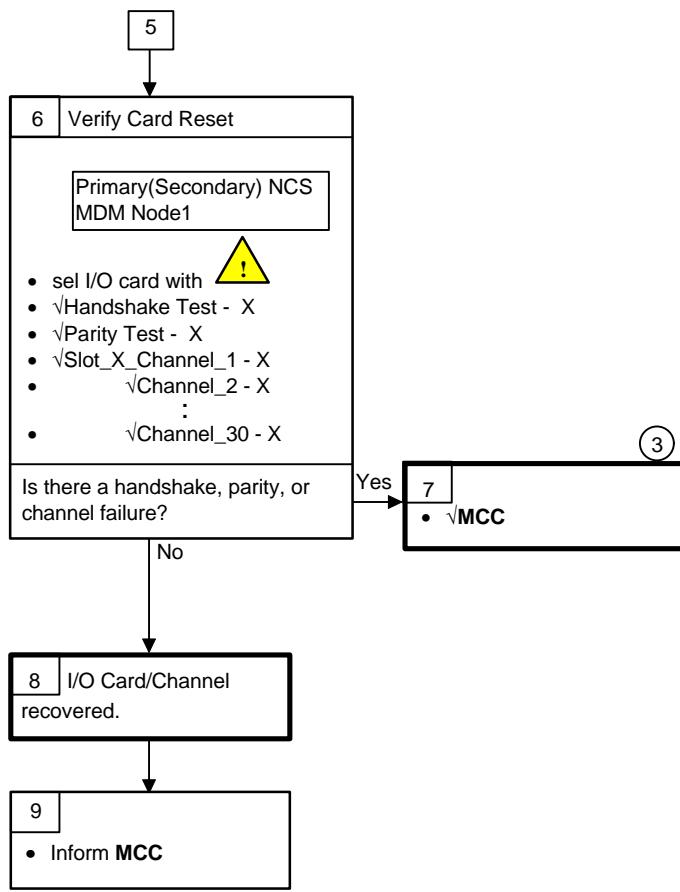
CAUTION ALARM
Attention Symbol will appear on card
User Notification
Attention Symbol, or call from crew, or another console with funny data

Nominal Config:
Comm Via Early Comm or OIU

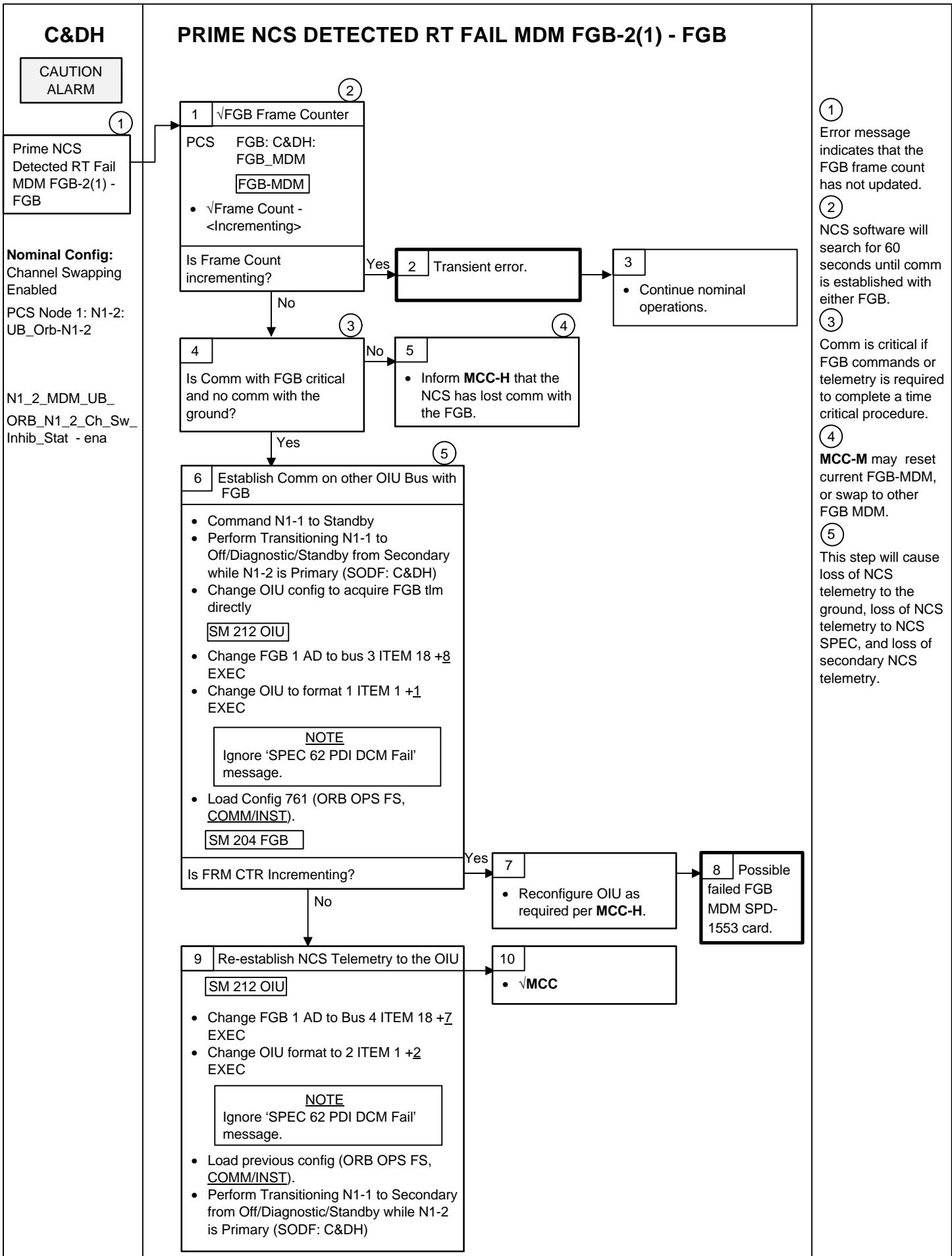


(1) Check with MCC to decide if want to power cycle the MDM to try and regain the I/O card.

(2) Before resetting the card, decide if card is supporting more important tasks on any good channel or if need to wait before card reset. This is done via the Node Channelization Chart.



(3)
Check with **MCC** to decide if want to power cycle the MDM to try and regain the I/O card.



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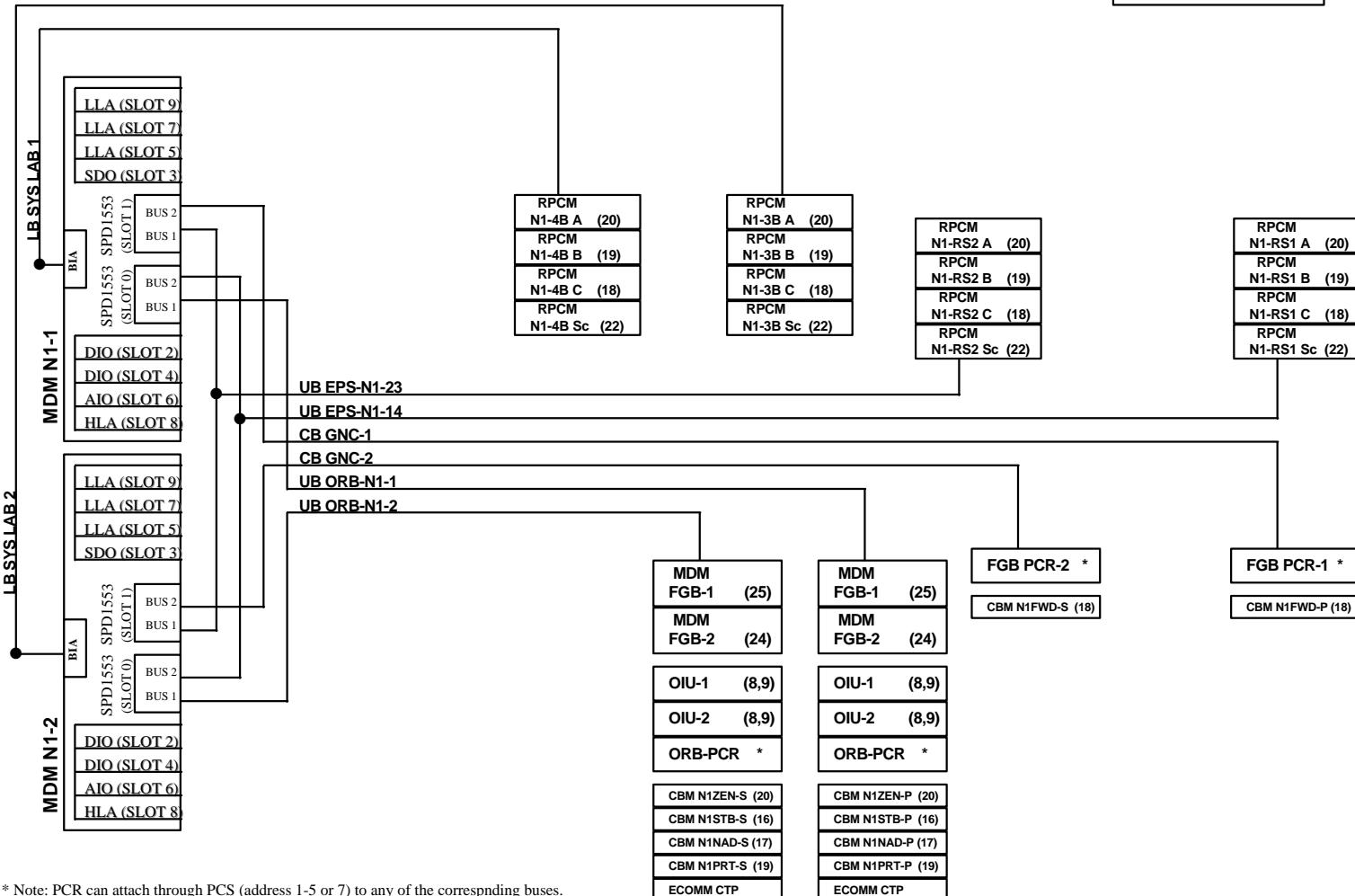
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SSC WORLD MAP KEYBOARD REFERENCE	TBD

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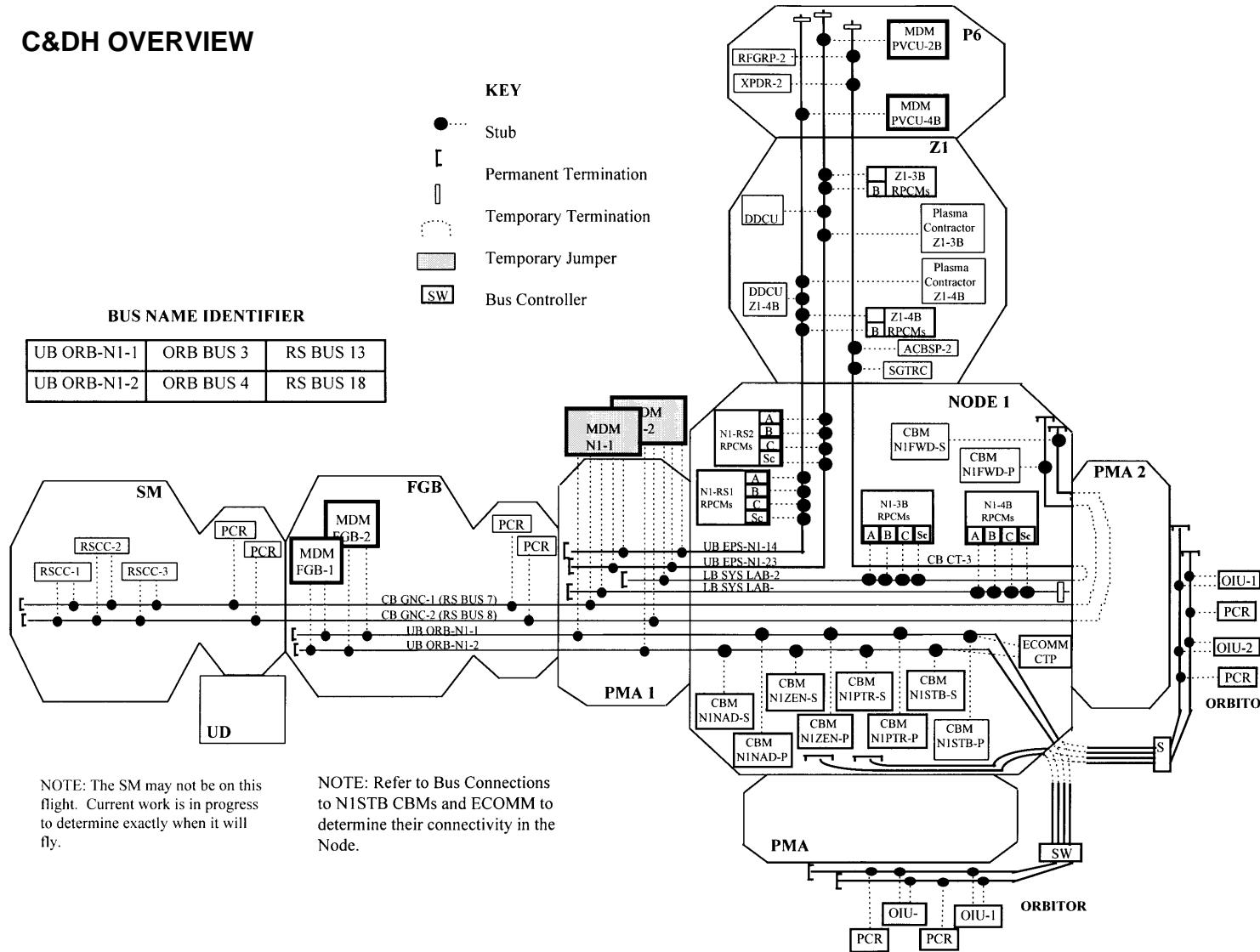
1553 Bus Assignments

(RT addresses in parenthesis.)



* Note: PCR can attach through PCS (address 1-5 or 7) to any of the corresponding buses.

C&DH OVERVIEW



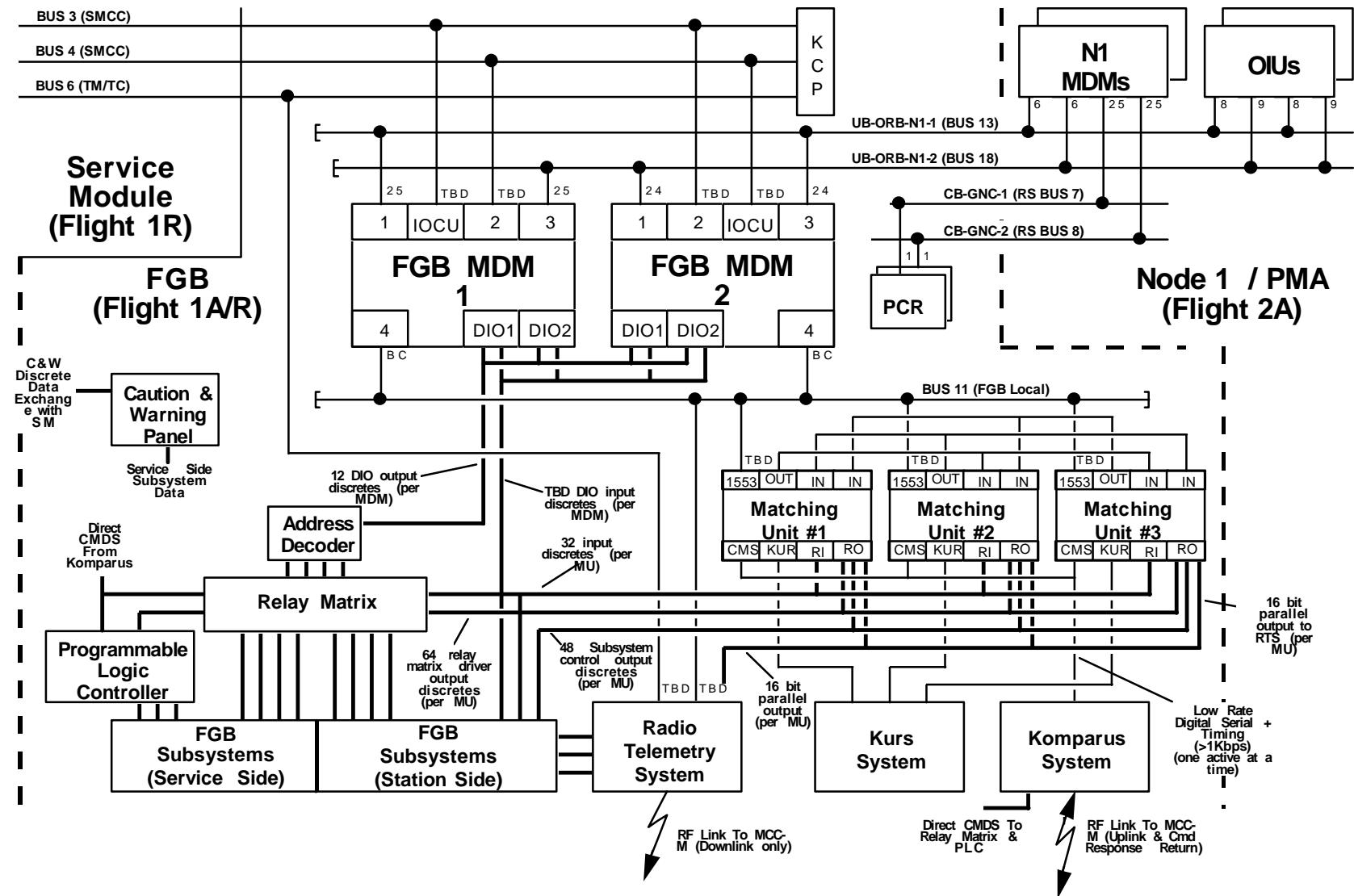


Figure 1. - FGB Computer System Hardware Block Diagram

INPUT/OUTPUT CARDS

I/O Card	Typical Uses	Number of Channels
Low Level Analog (LLA)	Reads analog voltage or supplies the current source to measure the voltage drop across a Resistive Temperature Device. Mainly used for precise temperature measurements.	32
High Level Analog (HLA)	Reads analog sensors, such as pressure, flow rate, and speed, and supplies power for transducers.	32
Analog Input Output (AIO)	Drives analog effectors (fan speeds, valve speeds) and reads analog sensor voltage.	16
Digital Input Output (DIO)	Reads discrete sensors (valve/switch positions) and commands discrete effectors (valve/switch enable).	32
Solenoid Driver Output (SDO)	Activates and deactivates solenoids and valves. Drives effectors that require a separate power source but routed through MDM.	16

N1-1 MDM Channel Assignments

Name	Description	MDM	Card Refdes	Card Type	Slot No.	Chanl No.	Chanl Type	ISS Element	OPS Position	Flight Activation	Flight Deactivation
HX Lab LT-A Inl V Norm Fl Pos	Lab LT-A HX Inlet Byp Vlv Norm Flow Pos Ind	N1-1	A09	DIO	SL02	CH00	A	Lab	ECLSS	5A	12A
HX Lab LT-A Inl V Byp Fl Pos	Lab LT-A HX Inlet Byp Vlv Byp Flow Pos	N1-1	A09	DIO	SL02	CH01	A	Lab	ECLSS	5A	12A
HX Lab LT-A Out V Open Pos	Lab LT-A HX Outlet Isln/Rlf Vlv Open Pos Ind	N1-1	A09	DIO	SL02	CH02	B	Lab	ECLSS	5A	12A
HX Lab LT-A Out V Cls Pos	Lab LT-A HX Outlet Isln/Rlf Vlv Cls Pos Ind	N1-1	A09	DIO	SL02	CH03	B	Lab		5A	12A
Smk Det N1-1 Bit Enbl	Node-1 Smk Det-1 Bit Enbl	N1-1	A09	DIO	SL02	CH04	B	Node-1		2A	AC
VAV Dmpr N1-N1 EnableCmd	Node-1 Air Mix Vlv Enable Cmd	N1-1	A09	DIO	SL02	CH05	A	Node-1	ECLSS	2A	AC
IMV Fan N1-Aft Rtn On/Off Cmd	Node-1 Aft IMV Fan On/Off Cmd	N1-1	A09	DIO	SL02	CH06	A	Node-1	ECLSS	2A	AC
Cab Vent Fan N1 On/Off Cmd	Node-1 Cabin Fan On/Off Cmd	N1-1	A09	DIO	SL02	CH07	A	Node-1	ECLSS	2A	AC
TWV N1-1 Pos A	Node-1 3-Way SDS Vlv-1 Pos A	N1-1	A09	DIO	SL02	CH08	A	Node-1	?	2A	AC
TWV N1-1 Pos B	Node-1 3-Way SDS Vlv-1 Pos B	N1-1	A09	DIO	SL02	CH09	A	Node-1	?	2A	AC
TWV N1-2 Pos A	Node-1 3-Way SDS Vlv-2 PosA	N1-1	A09	DIO	SL02	CH10	B	Node-1	?	2A	AC
TWV N1-2 Pos B	Node-1 3-Way SDS Vlv-2 Pos B	N1-1	A09	DIO	SL02	CH11	B	Node-1	?	2A	AC
TWV N1-3 Pos A	Node-1 3-Way SDS Vlv-3 Pos A	N1-1	A09	DIO	SL02	CH12	B	Node-1	?	2A	AC
TWV N1-3 Pos B	Node-1 3-Way SDS Vlv-3 Pos B	N1-1	A09	DIO	SL02	CH13	A	Node-1	?	2A	AC
TWV N1-4 Pos A	Node-1 3-Way SDS Vlv 4 PosA	N1-1	A09	DIO	SL02	CH14	A	Node-1	?	2A	AC
TWV N1-4 Pos B	Node-1 3-Way SDS Vlv-4 Pos B	N1-1	A09	DIO	SL02	CH15	A	Node-1	?	2A	AC
IMV V N1-Aft Rtn Cls Pos	Node-1 Aft Rtn IMV Vlv Cls Pos	N1-1	A09	DIO	SL02	CH16	A	Node-1	ECLSS	2A	AC
IMV V N1-Aft Rtn Enbl Cmd	Node-1 Aft Rtn IMV Vlv Enable Cmd	N1-1	A09	DIO	SL02	CH17	A	Node-1	ECLSS	2A	AC
IMV V N1-Aft Rtn Open Pos	Node-1 Aft Rtn IMV Vlv Open Pos	N1-1	A09	DIO	SL02	CH18	B	Node-1	ECLSS	2A	AC
IMV V N1-Aft Sply Open Pos	Node-1 Aft Sply IMV Vlv Open Pos	N1-1	A09	DIO	SL02	CH19	B	Node-1	ECLSS	2A	AC
IMV V N1-Aft Sply Cls Pos	Node-1 Aft Sply IMV Vlv Cls Pos	N1-1	A09	DIO	SL02	CH20	B	Node-1	ECLSS	2A	AC
IMV V N1-Aft Sply Enbl Cmd	Node-1 Aft Sply IMV Vlv Enable Cmd	N1-1	A09	DIO	SL02	CH21	A	Node-1	ECLSS	2A	AC
IMV V N1-Port Sply Open Pos	Node-1 Port Sply IMV Vlv Open Pos	N1-1	A09	DIO	SL02	CH22	A	Node-1	ECLSS	2A	AC
IMV V N1-Port Sply Cls Pos	Node-1 Port Sply IMV Vlv Cls Pos	N1-1	A09	DIO	SL02	CH23	A	Node-1	ECLSS	2A	AC
IMV V N1-Port Sply Enbl Cmd	Node-1 Port Sply IMV Vlv Enable Cmd	N1-1	A09	DIO	SL02	CH24	A	Node-1	ECLSS	2A	AC
IMV V N1-Stbd Rtn Enbl Cmd	Node-1 Stbd Rtn IMV Vlv Enable Cmd	N1-1	A09	DIO	SL02	CH25	A	Node-1	ECLSS	2A	AC
IMV V N1-Stbd Rtn Open Pos	Node-1 Stbd Rtn IMV Vlv Open Pos	N1-1	A09	DIO	SL02	CH26	B	Node-1	ECLSS	2A	AC
IMV V N1-Stbd Rtn Cls Pos	Node-1 Stbd Rtn IMV Vlv Cls Pos	N1-1	A09	DIO	SL02	CH27	B	Node-1	ECLSS	2A	AC
IMV V N1-Stbd Sply Open Pos	Node-1 Stbd Sply IMV Vlv Open Pos	N1-1	A09	DIO	SL02	CH28	B	Node-1	ECLSS	2A	AC
IMV V N1-Stbd Sply Cls Pos	Node-1 Stbd Sply IMV Vlv Cls Pos	N1-1	A09	DIO	SL02	CH29	A	Node-1	ECLSS	2A	AC
IMV V N1-Stbd Sply Enbl Cmd	Node-1 Stbd Sply IMV Vlv Enable Cmd	N1-1	A09	DIO	SL02	CH30	A	Node-1	ECLSS	2A	AC
SPARE	SPARE	N1-1	A09	DIO	SL02	CH31	SPARE	SPARE	SPARE		
SSMDM N1-2 Htr Pwr	MDM PMAI-2 Htr Pwr	N1-1	A05	SDO	SL03	CH00	n/a	PMA-1	TCS	2A	AC
HX Lab LT-A Inl V Norm Fl Cmd	Lab LT-A HX Inlet Byp Vlv Norm Flow Cmd	N1-1	A05	SDO	SL03	CH01	n/a	Lab	ECLSS	5A	12A
HX Lab LT-A Inl V Byp Fl Cmd	Lab LT-A HX Inlet Byp Vlv Byp Flow Cmd	N1-1	A05	SDO	SL03	CH02	n/a	Lab	ECLSS	5A	12A
HX Lab LT-A Out V Open Cmd	Lab LT-A HX Outlet Isln/Rlf Vlv Open Cmd	N1-1	A05	SDO	SL03	CH03	n/a	Lab	ECLSS	5A	12A
HX Lab LT-A Out V Cls Cmd	Lab LT-A HX Outlet Isln/Rlf Vlv Cls Cmd	N1-1	A05	SDO	SL03	CH04	n/a	Lab	ECLSS	5A	12A
TWV N1-1 Solenoid Cmd	Node-1 3-Way SDS Vlv-1 Solenoid Cmd	N1-1	A05	SDO	SL03	CH05	n/a	Node-1	?	2A	AC
TWV N1-1 Latch Cmd	Node-1 3-Way SDS Vlv-1 Latch Cmd	N1-1	A05	SDO	SL03	CH06	n/a	Node-1	?	2A	AC

N1-1 MDM Channel Assignments

Name	Description	MDM	Card Refdes	Card Type	Slot No.	Chanl No.	Chanl Type	ISS Element	OPS Position	Flight Activation	Flight Deactivation
TWV N1-2 Solenoid Cmd	Node-1 3-Way SDS Vlv-2 Solenoid Cmd	N1-1	A05	SDO	SL03	CH07	n/a	Node-1	?	2A	AC
TWV N1-2 Latch Cmd	Node-1 3-Way SDS Vlv-2 Latch Cmd	N1-1	A05	SDO	SL03	CH08	n/a	Node-1	?	2A	AC
TWV N1-3 Solenoid Cmd	Node-1 3-Way SDS Vlv-3 Solenoid Cmd	N1-1	A05	SDO	SL03	CH09	n/a	Node-1	?	2A	AC
TWV N1-3 Latch Cmd	Node-1 3-Way SDS Vlv-3 Latch Cmd	N1-1	A05	SDO	SL03	CH10	n/a	Node-1	?	2A	AC
TWV N1-4 Solenoid Cmd	Node-1 3-Way SDS Vlv-4 Solenoid Cmd	N1-1	A05	SDO	SL03	CH11	n/a	Node-1	?	2A	AC
TWV N1-4 Latch Cmd	Node-1 3-Way SDS Vlv-4 Latch Cmd	N1-1	A05	SDO	SL03	CH12	n/a	Node-1	?	2A	AC
SPARE	SPARE	N1-1	A05	SDO	SL03	CH13	n/a	SPARE	SPARE		
SPARE	SPARE	N1-1	A05	SDO	SL03	CH14	n/a	SPARE	SPARE		
SPARE	SPARE	N1-1	A05	SDO	SL03	CH15	n/a	SPARE	SPARE		
SPARE	SPARE	N1-1	A05	SDO	SL03	CH16	n/a	SPARE	SPARE		
SPARE	SPARE	N1-1	A10	DIO	SL04	CH00	SPARE	SPARE	SPARE		
SPARE	SPARE	N1-1	A10	DIO	SL04	CH01	SPARE	SPARE	SPARE		
SPARE	SPARE	N1-1	A10	DIO	SL04	CH02	SPARE	SPARE	SPARE		
SPARE	SPARE	N1-1	A10	DIO	SL04	CH03	SPARE	SPARE	SPARE		
SPARE	SPARE	N1-1	A10	DIO	SL04	CH04	SPARE	SPARE	SPARE		
SPARE	SPARE	N1-1	A10	DIO	SL04	CH05	SPARE	SPARE	SPARE		
SPARE	SPARE	N1-1	A10	DIO	SL04	CH06	SPARE	SPARE	SPARE		
SPARE	SPARE	N1-1	A10	DIO	SL04	CH07	SPARE	SPARE	SPARE		
SPARE	SPARE	N1-1	A10	DIO	SL04	CH08	SPARE	SPARE	SPARE		
SPARE	SPARE	N1-1	A10	DIO	SL04	CH09	SPARE	SPARE	SPARE		
SPARE	SPARE	N1-1	A10	DIO	SL04	CH10	SPARE	SPARE	SPARE		
SPARE	SPARE	N1-1	A10	DIO	SL04	CH11	SPARE	SPARE	SPARE		
SPARE	SPARE	N1-1	A10	DIO	SL04	CH12	SPARE	SPARE	SPARE		
SPARE	SPARE	N1-1	A10	DIO	SL04	CH13	SPARE	SPARE	SPARE		
SPARE	SPARE	N1-1	A10	DIO	SL04	CH14	SPARE	SPARE	SPARE		
SPARE	SPARE	N1-1	A10	DIO	SL04	CH15	SPARE	SPARE	SPARE		
Psiv APAS PMA2 Cap Plngr L-1 Pos	PMA-2 Passive APAS Capture Plunger Long-1 Pos	N1-1	A10	DIO	SL04	CH16	A	PMA-2	OSO	2A	5A
Psiv APAS PMA2 Cap Plngr S-1 Pos	PMA-2 Passive APAS Capture Plunger Short-1 Pos	N1-1	A10	DIO	SL04	CH17	A	PMA-2	OSO	2A	5A
Psiv APAS PMA2 Dep Plngr-1 Pos	PMA-2 Passive APAS Departure Plunger-1	N1-1	A10	DIO	SL04	CH18	B	PMA-2	OSO	2A	5A
Psiv APAS PMA2 Intf Sealed-1 Pos	PMA-2 Passive APAS Interface Sealed-1 Pos	N1-1	A10	DIO	SL04	CH19	B	PMA-2	OSO	2A	5A
SPARE	SPARE	N1-1	A10	DIO	SL04	CH20	SPARE	SPARE	SPARE		
GNC Moding Ind PMA2 Active ACS Ind Cmd-1	PMA-2 Talkback Panel Active ACS Ind Cmd-1	N1-1	A10	DIO	SL04	CH21	A	PMA-2	MCS	2A	5A
GNC Moding Ind PMA2 Free Drift Ind Cmd-1	PMA-2 Talkback Panel Free Drift Ind Cmd-1	N1-1	A10	DIO	SL04	CH22	A	PMA-2	MCS	2A	5A

N1-1 MDM Channel Assignments

Name	Description	MDM	Card Refdes	Card Type	Slot No.	Chanl No.	Chanl Type	ISS Element	OPS Position	Flight Activation	Flight Deactivation
Psiv APAS PMA3 Cap Plngr L-1 Pos	PMA-3 Passive APAS Capture Plunger Long-1 Pos	N1-1	A10	DIO	SL04	CH23	A	PMA-3	OSO	3A	16A
Psiv APAS PMA3 Cap Plngr S-1 Pos	PMA-3 Passive APAS Capture Plunger Short-1 Pos	N1-1	A10	DIO	SL04	CH24	A	PMA-3	OSO	3A	16A
Psiv APAS PMA3 Dep Plngr-1 Pos	PMA-3 Passive APAS Departure Plunger-1 Pos	N1-1	A10	DIO	SL04	CH25	A	PMA-3	OSO	3A	16A
Psiv APAS PMA3 Intf Sealed-1 Pos	PMA-3 Passive APAS Interface Sealed-1 Pos	N1-1	A10	DIO	SL04	CH26	B	PMA-3	OSO	3A	16A
SPARE	SPARE	N1-1	A10	DIO	SL04	CH27	SPARE				
SPARE	SPARE	N1-1	A10	DIO	SL04	CH28	SPARE				
GNC Moding Ind PMA3 Active ACS Ind Cmd-1	PMA-3 Talkback Panel Active ACS Ind Cmd-1	N1-1	A10	DIO	SL04	CH29	A	PMA-3	MCS	2A	5A
GNC Moding Ind PMA3 Free Drift Ind Cmd-1	PMA-3 Talkback Panel Free Drift Ind Cmd-1	N1-1	A10	DIO	SL04	CH30	A	PMA-3	MCS	2A	5A
SPARE	SPARE	N1-1	A10	DIO	SL04	CH31	SPARE				
VAV Cont N1-N1 Exc	Node-1 Air Mix Rheostat Exc	N1-1	A04	LLA	SL05	CH00	A	Node-1	ECLSS	2A	AC
VAV Cont N1-N1 Pos	Node-1 Air Mix Rheostat Pos	N1-1	A04	LLA	SL05	CH01	B	Node-1	ECLSS	2A	AC
Smk Det N1-1 Scatter Meas	Node-1 Smk Det-1 Scatter Meas	N1-1	A04	LLA	SL05	CH02	B	Node-1	ECLSS	2A	AC
Smk Det N1-1 Obscuration Meas	Node-1 Smk Det-1 Obscuration Meas	N1-1	A04	LLA	SL05	CH03	A	Node-1	ECLSS	2A	AC
SPARE	SPARE	N1-1	A04	LLA	SL05	CH04	SPARE	SPARE	SPARE		
SPARE	SPARE	N1-1	A04	LLA	SL05	CH05	SPARE	SPARE	SPARE		
SPARE	SPARE	N1-1	A04	LLA	SL05	CH06	SPARE	SPARE	SPARE		
SPARE	SPARE	N1-1	A04	LLA	SL05	CH07	SPARE	SPARE	SPARE		
SPARE	SPARE	N1-1	A04	LLA	SL05	CH08	SPARE	SPARE	SPARE		
SPARE	SPARE	N1-1	A04	LLA	SL05	CH09	SPARE	SPARE	SPARE		
SPARE	SPARE	N1-1	A04	LLA	SL05	CH10	SPARE	SPARE	SPARE		
SPARE	SPARE	N1-1	A04	LLA	SL05	CH11	SPARE	SPARE	SPARE		
SPARE	SPARE	N1-1	A04	LLA	SL05	CH12	SPARE	SPARE	SPARE		
SPARE	SPARE	N1-1	A04	LLA	SL05	CH13	SPARE	SPARE	SPARE		
SPARE	SPARE	N1-1	A04	LLA	SL05	CH14	SPARE	SPARE	SPARE		
SPARE	SPARE	N1-1	A04	LLA	SL05	CH15	SPARE	SPARE	SPARE		
SPARE	SPARE	N1-1	A04	LLA	SL05	CH16	SPARE	SPARE	SPARE		
SPARE	SPARE	N1-1	A04	LLA	SL05	CH17	SPARE	SPARE	SPARE		
SPARE	SPARE	N1-1	A04	LLA	SL05	CH18	SPARE	SPARE	SPARE		
SPARE	SPARE	N1-1	A04	LLA	SL05	CH19	SPARE	SPARE	SPARE		
SPARE	SPARE	N1-1	A04	LLA	SL05	CH20	SPARE	SPARE	SPARE		
SPARE	SPARE	N1-1	A04	LLA	SL05	CH21	SPARE	SPARE	SPARE		
SPARE	SPARE	N1-1	A04	LLA	SL05	CH22	SPARE	SPARE	SPARE		
SPARE	SPARE	N1-1	A04	LLA	SL05	CH23	SPARE	SPARE	SPARE		
SPARE	SPARE	N1-1	A04	LLA	SL05	CH24	SPARE	SPARE	SPARE		

N1-1 MDM Channel Assignments

Name	Description	MDM	Card Refdes	Card Type	Slot No.	Chanl No.	Chanl Type	ISS Element	OPS Position	Flight Activation	Flight Deactivation
SPARE	SPARE	N1-1	A04	LLA	SL05	CH25	SPARE	SPARE	SPARE		
SPARE	SPARE	N1-1	A04	LLA	SL05	CH26	SPARE	SPARE	SPARE		
SPARE	SPARE	N1-1	A04	LLA	SL05	CH27	SPARE	SPARE	SPARE		
SPARE	SPARE	N1-1	A04	LLA	SL05	CH28	SPARE	SPARE	SPARE		
SPARE	SPARE	N1-1	A04	LLA	SL05	CH29	SPARE	SPARE	SPARE		
SPARE	SPARE	N1-1	A04	LLA	SL05	CH30	SPARE	SPARE	SPARE		
SPARE	SPARE	N1-1	A04	LLA	SL05	CH31	SPARE	SPARE	SPARE		
SPARE	SPARE	N1-1	All	AIO	SL06	CH00	SPARE	SPARE	SPARE		
SPARE	SPARE	N1-1	All	AIO	SL06	CH01	SPARE	SPARE	SPARE		
VAV Dmpr N1-N1 Pos Cmd	Node-1 Air Mix Vlv Pos Cmd	N1-1	All	AIO	SL06	CH02	B	Node-1	ECLSS	2A	AC
Cab Vent Fan N1 Speed Cmd	Node-1 Cabin Fan Speed Cmd	N1-1	All	AIO	SL06	CH03	A	Node-1	ECLSS	2A	AC
IMV V N1-Aft Rtn Speed Cmd	Node-1 Aft Rtn IMV Vlv Speed Cmd	N1-1	All	AIO	SL06	CH04	B	Node-1	ECLSS	2A	AC
IMV V N1-Aft Sply Speed Cmd	Node-1 Aft Sply IMV Vlv Speed Cmd	N1-1	All	AIO	SL06	CH05	A	Node-1	ECLSS	2A	AC
IMV V N1-Port Sply Speed Cmd	Node-1 Port Sply IMV Vlv Speed Cmd	N1-1	All	AIO	SL06	CH06	A	Node-1	ECLSS	2A	AC
IMV V N1-Stbd Rtn Speed Cmd	Node-1 Stbd Rtn IMV Vlv Speed Cmd	N1-1	All	AIO	SL06	CH07	B	Node-1	ECLSS	2A	AC
IMV V N1-Stbd Sply Speed Cmd	Node-1 Stbd Sply IMV Vlv Speed Cmd	N1-1	All	AIO	SL06	CH08	B	Node-1	ECLSS	2A	AC
SPARE	SPARE	N1-1	All	AIO	SL06	CH09	SPARE	SPARE	SPARE		
SPARE	SPARE	N1-1	All	AIO	SL06	CH10	SPARE	SPARE	SPARE		
SPARE	SPARE	N1-1	All	AIO	SL06	CH11	SPARE	SPARE	SPARE		
SPARE	SPARE	N1-1	All	AIO	SL06	CH12	SPARE	SPARE	SPARE		
SPARE	SPARE	N1-1	All	AIO	SL06	CH13	SPARE	SPARE	SPARE		
SPARE	SPARE	N1-1	All	AIO	SL06	CH14	SPARE	SPARE	SPARE		
SPARE	SPARE	N1-1	All	AIO	SL06	CH15	SPARE	SPARE	SPARE		
SPARE	SPARE	N1-1	All	AIO	SL06	CH16	SPARE	SPARE	SPARE		
HX Lab LT-A Out RTD Meas	Lab LT-A HX Outlet RTD Meas	N1-1	A03	LLA	SL07	CH00	A	Lab	TCS	5A	12A
Pri Struct N1 RTD Zone 1-1 Meas	Node-1 Shell Zone-1 RTD-1 Meas	N1-1	A03	LLA	SL07	CH01	B	Node-1	TCS	2A	AC
Pri Struct N1 RTD Zone 1-3 Meas	Node-1 Shell Zone-1 RTD-3 Meas	N1-1	A03	LLA	SL07	CH02	B	Node-1	TCS	2A	AC
Pri Struct N1 RTD Zone 2-1 Meas	Node-1 Shell Zone-2 RTD-1 Meas	N1-1	A03	LLA	SL07	CH03	A	Node-1	TCS	2A	AC
Pri Struct N1 RTD Zone 3-1 Meas	Node-1 Shell Zone-3 RTD-1 Meas	N1-1	A03	LLA	SL07	CH04	B	Node-1	TCS	2A	AC
Pri Struct N1 RTD Zone 3-3 Meas	Node-1 Shell Zone-3 RTD-3 Meas	N1-1	A03	LLA	SL07	CH05	A	Node-1	TCS	2A	AC
Pri Struct N1 RTD Zone 4-1 Meas	Node-1 Shell Zone-4 RTD-1 Meas	N1-1	A03	LLA	SL07	CH06	A	Node-1	TCS	2A	AC
Pri Struct N1 RTD Zone 5-1 Meas	Node-1 Shell Zone-5 RTD-1 Meas	N1-1	A03	LLA	SL07	CH07	B	Node-1	TCS	2A	AC
Pri Struct N1 RTD Zone 5-3 Meas	Node-1 Shell Zone-5 RTD-3 Meas	N1-1	A03	LLA	SL07	CH08	B	Node-1	TCS	2A	AC
Pri Struct N1 RTD Zone 6-1 Meas	Node-1 Shell Zone-6 RTD-1 Meas	N1-1	A03	LLA	SL07	CH09	A	Node-1	TCS	2A	AC
Pri Struct N1 RTD Zone 6-3 Meas	Node-1 Shell Zone-6 RTD-3 Meas	N1-1	A03	LLA	SL07	CH10	A	Node-1	TCS	2A	AC
Pri Struct N1 RTD Zone 7-1 Meas	Node-1 Shell Zone-7 RTD-1 Meas	N1-1	A03	LLA	SL07	CH11	B	Node-1	TCS	2A	AC
Pri Struct N1 RTD Zone 7-3 Meas	Node-1 Shell Zone-7 RTD-3 Meas	N1-1	A03	LLA	SL07	CH12	A	Node-1	TCS	2A	AC
Pri Struct N1 RTD Zone 8-1 Meas	Node-1 Shell Zone-8 RTD-1 Meas	N1-1	A03	LLA	SL07	CH13	B	Node-1	TCS	2A	AC

N1-1 MDM Channel Assignments

Name	Description	MDM	Card Refdes	Card Type	Slot No.	Chanl No.	Chanl Type	ISS Element	OPS Position	Flight Activation	Flight Deactivation
Pri Struct N1 RTD Zone 9-1 Meas	Node-1 Shell Zone-9 RTD-1 Meas	N1-1	A03	LLA	SL07	CH14	B	Node-1	TCS	2A	AC
SPARE	SPARE	N1-1	A03	LLA	SL07	CH15	SPARE	SPARE	SPARE		
SPARE	SPARE	N1-1	A03	LLA	SL07	CH16	SPARE	SPARE	SPARE		
SPARE	SPARE	N1-1	A03	LLA	SL07	CH17	SPARE	SPARE	SPARE		
Pri Struct N2 RTD Zone 1-1 Meas	Node-2 Shell Zone-1 RTD-1 Meas	N1-1	A03	LLA	SL07	CH18	A	Node-2	TCS	10A	10A
Pri Struct N2 RTD Zone 2-1 Meas	Node-2 Shell Zone-1 RTD-3 Meas	N1-1	A03	LLA	SL07	CH19	B	Node-2	TCS	10A	10A
Pri Struct N2 RTD Zone 9-1 Meas	Node-2 Shell Zone-2 RTD-1 Meas	N1-1	A03	LLA	SL07	CH20	A	Node-2	TCS	10A	10A
Pri Struct N2 RTD Zone 3-2 Meas	Node-2 Shell Zone-3 RTD-1 Meas	N1-1	A03	LLA	SL07	CH21	B	Node-2	TCS	10A	10A
Pri Struct N2 RTD Zone 5-1 Meas	Node-2 Shell Zone-3 RTD-3 Meas	N1-1	A03	LLA	SL07	CH22	B	Node-2	TCS	10A	10A
Pri Struct N2 RTD Zone 6-1 Meas	Node-2 Shell Zone-4 RTD-1 Meas	N1-1	A03	LLA	SL07	CH23	A	Node-2	TCS	10A	10A
Pri Struct N2 RTD Zone 7-1 Meas	Node-2 Shell Zone-5 RTD-1 Meas	N1-1	A03	LLA	SL07	CH24	A	Node-2	TCS	10A	10A
Pri Struct N2 RTD Zone 1-3 Meas	Node-2 Shell Zone-5 RTD-3 Meas	N1-1	A03	LLA	SL07	CH25	B	Node-2	TCS	10A	10A
Pri Struct N2 RTD Zone 2-2 Meas	Node-2 Shell Zone-6 RTD-1 Meas	N1-1	A03	LLA	SL07	CH26	B	Node-2	TCS	10A	10A
Pri Struct N2 RTD Zone 9-2 Meas	Node-2 Shell Zone-6 RTD-3 Meas	N1-1	A03	LLA	SL07	CH27	A	Node-2	TCS	10A	10A
Pri Struct N2 RTD Zone 3-4 Meas	Node-2 Shell Zone-7 RTD-1 Meas	N1-1	A03	LLA	SL07	CH28	B	Node-2	TCS	10A	10A
Pri Struct N2 RTD Zone 5-3 Meas	Node-2 Shell Zone-7 RTD-3 Meas	N1-1	A03	LLA	SL07	CH29	A	Node-2	TCS	10A	10A
Pri Struct N2 RTD Zone 6-3 Meas	Node-2 Shell Zone-8 RTD-1 Meas	N1-1	A03	LLA	SL07	CH30	A	Node-2	TCS	10A	10A
Pri Struct N2 RTD Zone 7-3 Meas	Node-2 Shell Zone-9 RTD-1 Meas	N1-1	A03	LLA	SL07	CH31	B	Node-2	TCS	10A	10A
VAV Dmpr N1-N1 Pos Fdbk	Node-1 Air Mix Vlv Pos Fdbk	N1-1	A12	HLA	SL08	CH00	A	Node-1	ECLSS	2A	AC
IMV Fan N1-Aft Rtn Speed Fdbk	Node-1 Aft IMV Fan Speed Fdbk	N1-1	A12	HLA	SL08	CH01	B	Node-1	ECLSS	2A	AC
Cab Vent Fan N1 Speed Fdbk	Node-1 Cabin Fan Speed Fdbk	N1-1	A12	HLA	SL08	CH02	B	Node-1	ECLSS	2A	AC
Cab Vent Fan N1 Diff Press Xdcr Meas	Node-1 Cabin Fan Diff Press Xdcr Meas	N1-1	A12	HLA	SL08	CH03	A	Node-1	ECLSS	2A	AC
SPARE	SPARE	N1-1	A12	HLA	SL08	CH04	SPARE	SPARE	SPARE		
SPARE	SPARE	N1-1	A12	HLA	SL08	CH05	SPARE	SPARE	SPARE		
SPARE	SPARE	N1-1	A12	HLA	SL08	CH06	SPARE	SPARE	SPARE		
SPARE	SPARE	N1-1	A12	HLA	SL08	CH07	SPARE	SPARE	SPARE		
SPARE	SPARE	N1-1	A12	HLA	SL08	CH08	SPARE	SPARE	SPARE		
SPARE	SPARE	N1-1	A12	HLA	SL08	CH09	SPARE	SPARE	SPARE		
SPARE	SPARE	N1-1	A12	HLA	SL08	CH10	SPARE	SPARE	SPARE		
SPARE	SPARE	N1-1	A12	HLA	SL08	CH11	SPARE	SPARE	SPARE		
SPARE	SPARE	N1-1	A12	HLA	SL08	CH12	SPARE	SPARE	SPARE		
SPARE	SPARE	N1-1	A12	HLA	SL08	CH13	SPARE	SPARE	SPARE		
SPARE	SPARE	N1-1	A12	HLA	SL08	CH14	SPARE	SPARE	SPARE		
SPARE	SPARE	N1-1	A12	HLA	SL08	CH15	SPARE	SPARE	SPARE		
SPARE	SPARE	N1-1	A12	HLA	SL08	CH16	SPARE	SPARE	SPARE		
SPARE	SPARE	N1-1	A12	HLA	SL08	CH17	SPARE	SPARE	SPARE		
SPARE	SPARE	N1-1	A12	HLA	SL08	CH18	SPARE	SPARE	SPARE		
SPARE	SPARE	N1-1	A12	HLA	SL08	CH19	SPARE	SPARE	SPARE		
SPARE	SPARE	N1-1	A12	HLA	SL08	CH20	SPARE	SPARE	SPARE		

N1-1 MDM Channel Assignments

Name	Description	MDM	Card Refdes	Card Type	Slot No.	Chanl No.	Chanl Type	ISS Element	OPS Position	Flight Activation	Flight Deactivation
SPARE	SPARE	N1-1	A12	HLA	SL08	CH21	SPARE	SPARE	SPARE		
SPARE	SPARE	N1-1	A12	HLA	SL08	CH22	SPARE	SPARE	SPARE		
SPARE	SPARE	N1-1	A12	HLA	SL08	CH23	SPARE	SPARE	SPARE		
SPARE	SPARE	N1-1	A12	HLA	SL08	CH24	SPARE	SPARE	SPARE		
SPARE	SPARE	N1-1	A12	HLA	SL08	CH25	SPARE	SPARE	SPARE		
SPARE	SPARE	N1-1	A12	HLA	SL08	CH26	SPARE	SPARE	SPARE		
SPARE	SPARE	N1-1	A12	HLA	SL08	CH27	SPARE	SPARE	SPARE		
SPARE	SPARE	N1-1	A12	HLA	SL08	CH28	SPARE	SPARE	SPARE		
SPARE	SPARE	N1-1	A12	HLA	SL08	CH29	SPARE	SPARE	SPARE		
SPARE	SPARE	N1-1	A12	HLA	SL08	CH30	SPARE	SPARE	SPARE		
SPARE	SPARE	N1-1	A12	HLA	SL08	CH31	SPARE	SPARE	SPARE		
SSMDM N1-2 RTD Meas	MDM PMA1-2 RTD Meas	N1-1	A02	LLA	SL09	CH00	A	PMA-2	TCS	2A	AC
Press Shl PMA1 RTD-1 Meas	PMA-1 Shell RTD-1 Meas	N1-1	A02	LLA	SL09	CH01	B	PMA-1	TCS	2A	AC
Press Shl PMA1 RTD-2 Meas	PMA-1 Shell RTD-2 Meas	N1-1	A02	LLA	SL09	CH02	B	PMA-1	TCS	2A	AC
Press Shl PMA1 RTD-3 Meas	PMA-1 Shell RTD-3 Meas	N1-1	A02	LLA	SL09	CH03	A	PMA-1	TCS	2A	AC
Press Shl PMA1 RTD 4 Meas	PMA-1 Shell RTD 4 Meas	N1-1	A02	LLA	SL09	CH04	B	PMA-1	TCS	2A	AC
Press Shl PMA1 RTD-5 Meas	PMA-1 Shell RTD-5 Meas	N1-1	A02	LLA	SL09	CH05	A	PMA-1	TCS	2A	AC
Psiv APAS PMA2 Htch RTD-1 Meas	PMA-2 APAS Hatch RTD-1 Meas	N1-1	A02	LLA	SL09	CH06	A	PMA-2	TCS	2A	5A
Psiv APAS PMA2 Htch RTD-2 Meas	PMA-2 APAS Hatch RTD-2 Meas	N1-1	A02	LLA	SL09	CH07	B	PMA-2	TCS	2A	5A
Psiv APAS PMA2 Htch RTD-3 Meas	PMA-2 APAS Hatch RTD-3 Meas	N1-1	A02	LLA	SL09	CH08	B	PMA-2	TCS	2A	5A
Psiv APAS PMA2 Htch RTD 4 Meas	PMA-2 APAS Hatch RTD 4 Meas	N1-1	A02	LLA	SL09	CH09	A	PMA-2	TCS	2A	5A
SPARE	SPARE	N1-1	A02	LLA	SL09	CH10	SPARE	SPARE	SPARE		
SPARE	SPARE	N1-1	A02	LLA	SL09	CH11	SPARE	SPARE	SPARE		
SPARE	SPARE	N1-1	A02	LLA	SL09	CH12	SPARE	SPARE	SPARE		
SPARE	SPARE	N1-1	A02	LLA	SL09	CH13	SPARE	SPARE	SPARE		
SPARE	SPARE	N1-1	A02	LLA	SL09	CH14	SPARE	SPARE	SPARE		
SPARE	SPARE	N1-1	A02	LLA	SL09	CH15	SPARE	SPARE	SPARE		
SPARE	SPARE	N1-1	A02	LLA	SL09	CH16	SPARE	SPARE	SPARE		
SPARE	SPARE	N1-1	A02	LLA	SL09	CH17	SPARE	SPARE	SPARE		
SPARE	SPARE	N1-1	A02	LLA	SL09	CH18	SPARE	SPARE	SPARE		
SPARE	SPARE	N1-1	A02	LLA	SL09	CH19	SPARE	SPARE	SPARE		
SPARE	SPARE	N1-1	A02	LLA	SL09	CH20	SPARE	SPARE	SPARE		
SPARE	SPARE	N1-1	A02	LLA	SL09	CH21	SPARE	SPARE	SPARE		
CMGEA-2 RTD-1 Meas	CMGEA-2 RTD-1 Meas	N1-1	A02	LLA	SL09	CH22	B	ITC-Z1	?	?	?
CMGEA-2 RTD-2 Meas	CMGEA-2 RTD-2 Meas	N1-1	A02	LLA	SL09	CH23	A	ITC-Z1	?	?	?
CMGEA-3 RTD-1 Meas	CMGEA-3 RTD-1 Meas	N1-1	A02	LLA	SL09	CH24	A	ITC-Z1	?	?	?
CMGEA-3 RTD-2 Meas	CMGEA-3 RTD-2 Meas	N1-1	A02	LLA	SL09	CH25	B	ITC-Z1	?	?	?
SPARE	SPARE	N1-1	A02	LLA	SL09	CH26	SPARE	SPARE	SPARE		
SPARE	SPARE	N1-1	A02	LLA	SL09	CH27	SPARE	SPARE	SPARE		

N1-1 MDM Channel Assignments

Name	Description	MDM	Card Refdes	Card Type	Slot No.	Chanl No.	Chanl Type	ISS Element	OPS Position	Flight Activation	Flight Deactivation
SPDA Z1-3B Util Rail RTD-1 Meas	SPDA Z1-3B Util Rail RTD-1 Meas	N1-1	A02	LLA	SL09	CH28	B	ITC-Z1	TCS	3A	AC
SPARE	SPARE	N1-1	A02	LLA	SL09	CH29	SPARE	SPARE	SPARE		
SPARE	SPARE	N1-1	A02	LLA	SL09	CH30	SPARE	SPARE	SPARE		
SPDA Z1-4B Util Rail RTD-2 Meas	SPDA Z1-4B Util Rail RTD-2 Meas	N1-1	A02	LLA	SL09	CH31	B	ITC-Z1	TCS	3A	AC

N1-2 MDM Channel Assignments

Name	Description	MDM	Card Refdes	Card Type	Slot No.	Chnl No.	Chnl Type	ISS Element	OPS Position	Flight Activation	Flight Deactivation
HX Lab MT-B IN1 V Norm Fl Pos	Lab MT-B HX Inlet Byp Vlv Norm Flow Pos Ind	N1-2	A09	DIO	SL02	CH00	A	LAB	TCS	5A	12A
HX Lab MT-B IN1 V Byp Fl Cmd	Lab MT-B HX Inlet Byp Vlv Byp Flow Pos Ind	N1-2	A09	DIO	SL02	CH01	A	LAB	TCS	5A	12A
HX Lab MT-B Out V Open Pos	Lab MT-B HX Outlet Isn/Rlf Vlv Open Pos Ind	N1-2	A09	DIO	SL02	CH02	B	LAB	TCS	5A	12A
HX Lab MT-B Out V Cls Pos	Lab MT-B HX Outlet Isn/Rlf Vlv Cls Pos Ind	N1-2	A09	DIO	SL02	CH03	B	LAB	TCS	5A	12A
Smk Det N2-1 Bit Enbl	Node-1 Smk Det-2 Bit Enbl	N1-2	A09	DIO	SL02	CH04	B	Node-1	TCS	2A	AC
VAV Dmpr N1-CU Enbl Cmd	Cupola Air Mix Vlv Enable Cmd	N1-2	A09	DIO	SL02	CH05	A	Node-1	ECLSS	2A	AC
IMV Fan N1-Port Sply On/Off Cmd	Node-1 Port IMV Fan On/Off Cmd	N1-2	A09	DIO	SL02	CH06	A	Node-1	ECLSS	2A	AC
IMV Fan N1-Stbd Rtn On/Off Cmd	Node-1 Stbd IMV Fan On/Off Cmd	N1-2	A09	DIO	SL02	CH07	A	Node-1	ECLSS	2A	AC
Spare	Spare	N1-2	A09	DIO	SL02	CH08	Spare	Spare	Spare		
Spare	Spare	N1-2	A09	DIO	SL02	CH09	Spare	Spare	Spare		
Spare	Spare	N1-2	A09	DIO	SL02	CH10	Spare	Spare	Spare		
Spare	Spare	N1-2	A09	DIO	SL02	CH11	Spare	Spare	Spare		
Spare	Spare	N1-2	A09	DIO	SL02	CH12	Spare	Spare	Spare		
Spare	Spare	N1-2	A09	DIO	SL02	CH13	Spare	Spare	Spare		
Spare	Spare	N1-2	A09	DIO	SL02	CH14	Spare	Spare	Spare		
Spare	Spare	N1-2	A09	DIO	SL02	CH15	Spare	Spare	Spare		
IMV V N1-Fwd Rtn Open Pos	Node-1 Fwd Rtn IMV Vlv Cls Pos	N1-2	A09	DIO	SL02	CH16	A	Node-1	ECLSS	2A	AC
IMV V N1-Fwd Rtn Enbl Cmd	Node-1 Fwd Rtn IMV Vlv Enbl Cmd	N1-2	A09	DIO	SL02	CH17	A	Node-1	ECLSS	2A	AC
IMV V N1-Fwd Rtn Cls Pos	Node-1 Fwd Rtn IMV Vlv Open Pos	N1-2	A09	DIO	SL02	CH18	B	Node-1	ECLSS	2A	AC
IMV V N1-Fwd Sply Open Pos	Node-1 Fwd Sply IMV Vlv Open Pos	N1-2	A09	DIO	SL02	CH19	B	Node-1	ECLSS	2A	AC
IMV V N1-Fwd Sply Cls Pos	Node-1 Fwd Sply IMV Vlv Cls Pos	N1-2	A09	DIO	SL02	CH20	B	Node-1	ECLSS	2A	AC
IMV V N1-Fwd Sply Enbl Cmd	Node-1 Fwd Sply IMV Vlv Enbl Cmd	N1-2	A09	DIO	SL02	CH21	A	Node-1	ECLSS	2A	AC
IMV V N1-Nad Rtn Open Pos	Node-1 Nad Rtn IMV Vlv Open Pos	N1-2	A09	DIO	SL02	CH22	A	Node-1	ECLSS	2A	AC
IMV V N1-Nad Rtn Cls Pos	Node-1 Nad Rtn IMV Vlv Cls Pos	N1-2	A09	DIO	SL02	CH23	A	Node-1	ECLSS	2A	AC
IMV V N1-Nad Rtn Enbl Cmd	Node-1 Nad Rtn IMV Vlv Enbl Cmd	N1-2	A09	DIO	SL02	CH24	A	Node-1	ECLSS	2A	AC
IMV V N1-Nad Sply Enbl Cmd	Node-1 Nad Sply IMV Vlv Enbl Cmd	N1-2	A09	DIO	SL02	CH25	A	Node-1	ECLSS	2A	AC
IMV V N1-Nad Sply Open Pos	Node-1 Nad Sply IMV Vlv Open Pos	N1-2	A09	DIO	SL02	CH26	B	Node-1	ECLSS	2A	AC
IMV V N1-Nad Sply Cls Pos	Node-1 Nad Sply IMV Vlv Cls Pos	N1-2	A09	DIO	SL02	CH27	B	Node-1	ECLSS	2A	AC
Spare	Spare	N1-2	A09	DIO	SL02	CH28	Spare	Spare	ECLSS		
Spare	Spare	N1-2	A09	DIO	SL02	CH29	Spare	Spare	Spare		
Spare	Spare	N1-2	A09	DIO	SL02	CH30	Spare	Spare	Spare		
Spare	Spare	N1-2	A09	DIO	SL02	CH31	Spare	Spare	Spare		
SSMDM N1-1 Htr Pwr	MDM PMA1-1 Htr Pwr	N1-2	A05	SDO	SL03	CH00	n/a	PMA-1	TCS	2A	AC
HX Lab MT-B IN1 V Norm Fl Cmd	Lab MT-B HX Inlet Byp Vlv Norm Flow Cmd	N1-2	A05	SDO	SL03	CH01	n/a	LAB	TCS	5A	12A
HX Lab MT-B IN1 V Byp Fl Cmd	Lab MT-B HX Inlet Byp Vlv Byp Flow Cmd	N1-2	A05	SDO	SL03	CH02	n/a	LAB	TCS	5A	12A
HX Lab MT-B Out V Open Cmd	Lab MT-B HX Outlet Isn/Rlf Vlv Open Cmd	N1-2	A05	SDO	SL03	CH03	n/a	LAB	TCS	5A	12A
HX Lab MT-B Out V Cls Cmd	Lab MT-B HX Outlet Isn/Rlf Vlv Cls Cmd	N1-2	A05	SDO	SL03	CH04	n/a	LAB	TCS	5A	12A
Rnd Win Htr-1 Enbl Cmd	Cupola Rnd Window Htr-1 Enbl Cmd	N1-2	A05	SDO	SL03	CH05	n/a	Cupola	TCS	10A	AC
Rnd Win Htr-2 Enbl Cmd	Cupola Rnd Window Htr-2 Enbl Cmd	N1-2	A05	SDO	SL03	CH06	n/a	Cupola	TCS	10A	AC

N1-2 MDM Channel Assignments

Name	Description	MDM	Card Refdes	Card Type	Slot No.	Chanl No.	Chanl Type	ISS Element	OPS Position	Flight Activation	Flight Deactivation
Trap Win 1 Htr Enbl Cmd	Cupola Trap Window-1 Htr Enbl Cmd	N1-2	A05	SDO	SL03	CH07	n/a	Cupola	TCS	10A	AC
Trap Win 2 Htr Enbl Cmd	Cupola Trap Window-2 Htr Enbl Cmd	N1-2	A05	SDO	SL03	CH08	n/a	Cupola	TCS	10A	AC
Trap Win 3 Htr Enbl Cmd	Cupola Trap Window-3 Htr Enbl Cmd	N1-2	A05	SDO	SL03	CH09	n/a	Cupola	TCS	10A	AC
Trap Win 4 Htr Enbl Cmd	Cupola Trap Window-4 Htr Enbl Cmd	N1-2	A05	SDO	SL03	CH10	n/a	Cupola	TCS	10A	AC
Trap Win 5 RTD-1 Meas	Cupola Trap Window-5 Hrt Enbl Cmd	N1-2	A05	SDO	SL03	CH11	n/a	Cupola	TCS	10A	AC
Trap Win 6 RTD-1 Meas	Cupola Trap Window-6 Htr Enbl Cmd	N1-2	A05	SDO	SL03	CH12	n/a	Cupola	TCS	10A	AC
Spare	Spare	N1-2	A05	SDO	SL03	CH13	n/a	Spare	Spare		
Spare	Spare	N1-2	A05	SDO	SL03	CH14	n/a	Spare	Spare		
Spare	Spare	N1-2	A05	SDO	SL03	CH15	n/a	Spare	Spare		
Spare	Spare	N1-2	A05	SDO	SL03	CH16	n/a	Spare	Spare		
Spare	Spare	N1-2	A10	DIO	SL04	CH00	Spare	Spare	Spare		
Spare	Spare	N1-2	A10	DIO	SL04	CH01	Spare	Spare	Spare		
Spare	Spare	N1-2	A10	DIO	SL04	CH02	Spare	Spare	Spare		
Spare	Spare	N1-2	A10	DIO	SL04	CH03	Spare	Spare	Spare		
Spare	Spare	N1-2	A10	DIO	SL04	CH04	Spare	Spare	Spare		
Spare	Spare	N1-2	A10	DIO	SL04	CH05	Spare	Spare	Spare		
Spare	Spare	N1-2	A10	DIO	SL04	CH06	Spare	Spare	Spare		
Spare	Spare	N1-2	A10	DIO	SL04	CH07	Spare	Spare	Spare		
Spare	Spare	N1-2	A10	DIO	SL04	CH08	Spare	Spare	Spare		
Spare	Spare	N1-2	A10	DIO	SL04	CH09	Spare	Spare	Spare		
Spare	Spare	N1-2	A10	DIO	SL04	CH10	Spare	Spare	Spare		
Spare	Spare	N1-2	A10	DIO	SL04	CH11	Spare	Spare	Spare		
Spare	Spare	N1-2	A10	DIO	SL04	CH12	Spare	Spare	Spare		
Spare	Spare	N1-2	A10	DIO	SL04	CH13	Spare	Spare	Spare		
Spare	Spare	N1-2	A10	DIO	SL04	CH14	Spare	Spare	Spare		
Spare	Spare	N1-2	A10	DIO	SL04	CH15	Spare	Spare	Spare		
Psiv APAS PMA2 Cap Plngr L-2 Pos	PMA-2 Passive APAS Capture Plunger Long-2 Pos	N1-2	A10	DIO	SL04	CH16	A	PMA-2	OSO	2A	5A
Psiv APAS PMA2 Cap Plngr S-2 Pos	PMA-2 Passive APAS Capture Plunger Short-2 Pos	N1-2	A10	DIO	SL04	CH17	A	PMA-2	OSO	2A	5A
Psiv APAS PMA2 Dep Plngr-2 Pos	PMA-2 Passive APAS Departure Plngr-2 Pos	N1-2	A10	DIO	SL04	CH18	B	PMA-2	OSO	2A	5A
Psiv APAS PMA2 Intf Sealed-2 Pos	PMA-2 Passive APAS Interface Sealed-2 Pos	N1-2	A10	DIO	SL04	CH19	B	PMA-2	OSO	2A	5A
Spare	Spare			DIO	SL04	CH20	Spare	Spare	Spare		
GNC Moding Ind PMA2 Active ACS Ind Cmd-2	PMA-2 Talkback Panel Active ACS Ind Cmd-2	N1-2	A10	DIO	SL04	CH21	A	PMA-2	MCS	2A	5A
GNC Moding Ind PMA2 Free Drift Ind	PMA-2 Talkback Panel Free Drift Ind Cmd-2	N1-2	A10	DIO	SL04	CH22	A	PMA-2	MCS	2A	5A
Psiv APAS PMA3 Cap Plngr L-2 Pos	PMA-3 Passive APAS Capture Plngr Long-2 Pos	N1-2	A10	DIO	SL04	CH23	A	PMA-3	OSO	3A	16A

N1-2 MDM Channel Assignments

Name	Description	MDM	Card Refdes	Card Type	Slot No.	Chnl No.	Chnl Type	ISS Element	OPS Position	Flight Activation	Flight Deactivation
Psiv APAS PMA3 Cap Plngr S-2 Pos	PMA-3 Passive APAS Capture Plngr Short-2 Pos	N1-2	A10	DIO	SL04	CH24	A	PMA-3	OSO	3A	16A
Psiv APAS PMA3 Dep Plngr-2 Pos	PMA-3 Passive APAS Departure Plngr-2 Pos	N1-2	A10	DIO	SL04	CH25	A	PMA-3	OSO	3A	16A
Psiv APAS PMA3 Intf Sealed-2 Pos	PMA-3 Passive APAS Interface Sealed-2 Pos	N1-2	A10	DIO	SL04	CH26	B	PMA-3	OSO	3A	16A
Spare	Spare	N1-2	A10	DIO	SL04	CH27	Spare	Spare	Spare		
Spare	Spare	N1-2	A10	DIO	SL04	CH28	Spare	Spare	Spare		
GNC Moding Ind PMA3 Active ACS Ind Cmd-2	PMA3 Talkback Panel Active ACS Ind Cmd-2	N1-2	A10	DIO	SL04	CH29	A	PMA-3	MCS	3A	16A
GNC Moding Ind PMA3 Free Drift Ind Cmd-2	PMA-3 Talkback Panel Free Drift Ind Cmd-2	N1-2	A10	DIO	SL04	CH30	A	PMA-3	MCS	3A	16A
Spare	Spare	N1-2	A10	DIO	SL04	CH31	Spare	Spare	Spare		
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VAV Cont CU-CU Pos	CUPOLA Air Mix Rheostat Pos	N1-2	A04	LLA	SL05	CH00	A	Cupola	ECLSS	2A	AC
VAV Cont CU-CU Exc	CUPOLA Air Mix Rheostat Exc	N1-2	A04	LLA	SL05	CH01	B	Cupola	ECLSS	2A	AC
Smk Det N2-1 Scatter Meas	Node-1 Smk Det-2 Scatter Meas	N1-2	A04	LLA	SL05	CH02	B	Node-1	ECLSS	2A	AC
Smk Det N2-1 Obscuration Meas	Node-1 Smk Det-2 Obscuration Meas	N1-2	A04	LLA	SL05	CH03	A	Node-1	ECLSS	2A	AC
Rnd Win RTD-1 Meas	Cupola Rnd Window RTD-1A Meas	N1-2	A04	LLA	SL05	CH04	B	Cupola	TCS	10A	AC
Rnd Win RTD-3 Meas	Cupola Rnd Window RTD-2A Meas	N1-2	A04	LLA	SL05	CH05	A	Cupola	TCS	10A	AC
Trap Win 1 RTD-1 Meas	Cupola Trap Window-1 RTD-1 Meas	N1-2	A04	LLA	SL05	CH06	A	Cupola	TCS	10A	AC
Trap Win 1 RTD-3 Meas	Cupola Trap Window-1 RTD-3 Meas	N1-2	A04	LLA	SL05	CH07	B	Cupola	TCS	10A	AC
Trap Win 2 RTD-1 Meas	Cupola Trap Window-2 RTD-1 Meas	N1-2	A04	LLA	SL05	CH08	B	Cupola	TCS	10A	AC
Trap Win 2 RTD-3 Meas	Cupola Trap Window-2 RTD-3 Meas	N1-2	A04	LLA	SL05	CH09	A	Cupola	TCS	10A	AC
Trap Win 3 RTD-1 Meas	Cupola Trap Window-3 RTD-1 Meas	N1-2	A04	LLA	SL05	CH10	A	Cupola	TCS	10A	AC
Trap Win 3 RTD-3 Meas	Cupola Trap Window-3 RTD-3 Meas	N1-2	A04	LLA	SL05	CH11	B	Cupola	TCS	10A	AC
Trap Win 4 RTD-1 Meas	Cupola Trap Window 4 RTD-1 Meas	N1-2	A04	LLA	SL05	CH12	A	Cupola	TCS	10A	AC
Trap Win 4 RTD-3 Meas	Cupola Trap Window-4 RTD-3 Meas	N1-2	A04	LLA	SL05	CH13	B	Cupola	TCS	10A	AC
Trap Win 5 Htr Enbl Cmd	Cupola Trap Window-5 RTD-1 Meas	N1-2	A04	LLA	SL05	CH14	B	Cupola	TCS	10A	AC
Trap Win 5 RTD-3 Meas	Cupola Trap Window-5 RTD-3 Meas	N1-2	A04	LLA	SL05	CH15	A	Cupola	TCS	10A	AC
Trap Win 6 Htr Enbl Cmd	Cupola Trap Window-6 RTD-1 Meas	N1-2	A04	LLA	SL05	CH16	B	Cupola	TCS	10A	AC
Trap Win 6 RTD-3 Meas	Cupola Trap Window-6 RTD-3 Meas	N1-2	A04	LLA	SL05	CH17	A	Cupola	TCS	10A	AC
Rnd Win RTD-2 Meas	Cupola Rnd Window RTD-1B Meas	N1-2	A04	LLA	SL05	CH18	A	Cupola	TCS	10A	AC
Rnd Win RTD-4 Meas	Cupola Rnd Window RTD-2B Meas	N1-2	A04	LLA	SL05	CH19	B	Cupola	TCS	10A	AC
Trap Win 1 RTD-2 Meas	Cupola Trap Window-1 RTD-2 Meas	N1-2	A04	LLA	SL05	CH20	A	Cupola	TCS	10A	AC
Trap Win 1 RTD 4 Meas	Cupola Trap Window-1 RTD-4 Meas	N1-2	A04	LLA	SL05	CH21	B	Cupola	TCS	10A	AC
Trap Win 2 RTD-2 Meas	Cupola Trap Window-2 RTD-2 Meas	N1-2	A04	LLA	SL05	CH22	B	Cupola	TCS	10A	AC
Trap Win 2 RTD 4 Meas	Cupola Trap Window-2 RTD-4 Meas	N1-2	A04	LLA	SL05	CH23	A	Cupola	TCS	10A	AC
Trap Win 3 RTD-2 Meas	Cupola Trap Window-3 RTD-2 Meas	N1-2	A04	LLA	SL05	CH24	A	Cupola	TCS	10A	AC
Trap Win 3 RTD-4 Meas	Cupola Trap Window-3 RTD-4 Meas	N1-2	A04	LLA	SL05	CH25	B	Cupola	TCS	10A	AC
Trap Win 4 RTD-2 Meas	Cupola Trap Window-4 RTD-2 Meas	N1-2	A04	LLA	SL05	CH26	B	Cupola	TCS	10A	AC
Trap Win 4 RTD 4 Meas	Cupola Trap Window 4 RTD-4 Meas	N1-2	A04	LLA	SL05	CH27	A	Cupola	TCS	10A	AC

N1-2 MDM Channel Assignments

Name	Description	MDM	Card Refdes	Card Type	Slot No.	Chanl No.	Chanl Type	ISS Element	OPS Position	Flight Activation	Flight Deactivation
Trap Win 5 RTD-2 Meas	Cupola Trap Window-5 RTD-2 Meas	N1-2	A04	LLA	SL05	CH28	B	Cupola	TCS	10A	AC
Trap Win 5 RTD-4 Meas	Cupola Trap Window-5 RTD-4 Meas	N1-2	A04	LLA	SL05	CH29	A	Cupola	TCS	10A	AC
Trap Win 6 RTD-2 Meas	Cupola Trap Window-6 RTD-2 Meas	N1-2	A04	LLA	SL05	CH30	A	Cupola	TCS	10A	AC
Trap Win 6 RTD-4 Meas	Cupola Trap Window-6 RTD-4 Meas	N1-2	A04	LLA	SL05	CH31	B	Cupola	TCS	10A	AC
Spare	Spare	N1-2	A11	AIO	SL06	CH00	Spare	Spare	Spare		
Spare	Spare	N1-2	A11	AIO	SL06	CH01	Spare	Spare	Spare		
VAV Dmpr N1-CU Pos Cmd	Cupola Air Mix Vlv Pos Cmd	N1-2	A11	AIO	SL06	CH02	B	LS	TCS	2A	AC
Spare	Spare	N1-2	A11	AIO	SL06	CH03	Spare	Spare	Spare		
IMV V N1-Fwd Rtn Speed Cmd	Node-1 Fwd Rtn IMV Vlv Speed Cmd	N1-2	A11	AIO	SL06	CH04	B	Node-1	ECLSS	2A	AC
IMV V N1-Fwd Sply Speed Cmd	Node-1 Fwd Sply IMV Vlv Speed Cmd	N1-2	A11	AIO	SL06	CH05	A	Node-1	ECLSS	2A	AC
IMV V N1-Nad Rtn Speed Cmd	Node-1 Nad Rtn IMV Vlv Speed Cmd	N1-2	A11	AIO	SL06	CH06	A	Node-1	ECLSS	2A	AC
IMV V N1-Nad Sply Speed Cmd	Node-1 Nad Sply IMV Vlv Speed Cmd	N1-2	A11	AIO	SL06	CH07	B	Node-1	ECLSS	2A	AC
Spare	Spare	N1-2	A11	AIO	SL06	CH08	Spare	Spare	Spare		
Spare	Spare	N1-2	A11	AIO	SL06	CH09	Spare	Spare	Spare		
Spare	Spare	N1-2	A11	AIO	SL06	CH10	Spare	Spare	Spare		
Spare	Spare	N1-2	A11	AIO	SL06	CH11	Spare	Spare	Spare		
Spare	Spare	N1-2	A11	AIO	SL06	CH12	Spare	Spare	Spare		
Spare	Spare	N1-2	A11	AIO	SL06	CH13	Spare	Spare	Spare		
Spare	Spare	N1-2	A11	AIO	SL06	CH14	Spare	Spare	Spare		
Spare	Spare	N1-2	A11	AIO	SL06	CH15	Spare	Spare	Spare		
Spare	Spare	N1-2	A11	AIO	SL06	CH16	Spare	Spare	Spare		
HX Lab MT-B Out Rtd Meas	Lab MT-B HX Outlet RTD Meas	N1-2	A03	LLA	SL07	CH00	A	LAB	TCS		
Pn Struct N1 RTD Zone 1-2 Meas	Node-1 Shell Zone-1 RTD-2 Meas	N1-2	A03	LLA	SL07	CH01	B	Node-1	TCS	2A	AC
Pri Struct N1 RTD Zone 1-4 Meas	Node-1 Shell Zone-1 RTD-4 Meas	N1-2	A03	LLA	SL07	CH02	B	Node-1	TCS	2A	AC
Pri Struct N1 RTD Zone 2-2 Meas	Node-1 Shell Zone-2 RTD-2 Meas	N1-2	A03	LLA	SL07	CH03	A	Node-1	TCS	2A	AC
Pri Struct N1 RTD Zone 3-2 Meas	Node-1 Shell Zone-3 RTD-2 Meas	N1-2	A03	LLA	SL07	CH04	B	Node-1	TCS	2A	AC
Pri Struct N1 RTD Zone 3-4 Meas	Node-1 Shell Zone-3 RTD-4 Meas	N1-2	A03	LLA	SL07	CH05	A	Node-1	TCS	2A	AC
Pri Struct N1 RTD Zone 4-2 Meas	Node-1 Shell Zone 4 RTD-2 Meas	N1-2	A03	LLA	SL07	CH06	A	Node-1	TCS	2A	AC
Pri Struct N1 RTD Zone 5-2 Meas	Node-1 Shell Zone-5 RTD-2 Meas	N1-2	A03	LLA	SL07	CH07	B	Node-1	TCS	2A	AC
Pri Struct N1 RTD Zone 5-4 Meas	Node-1 Shell Zone-5 RTD-4 Meas	N1-2	A03	LLA	SL07	CH08	B	Node-1	TCS	2A	AC
Pri Struct N1 RTD Zone 6-2 Meas	Node-1 Shell Zone-6 RTD-2 Meas	N1-2	A03	LLA	SL07	CH09	A	Node-1	TCS	2A	AC
Pri Struct N1 RTD Zone 6-4 Meas	Node-1 Shell Zone-6 RTD-4 Meas	N1-2	A03	LLA	SL07	CH10	A	Node-1	TCS	2A	AC
Pri Struct N1 RTD Zone 7-2 Meas	Node-1 Shell Zone-7 RTD-2 Meas	N1-2	A03	LLA	SL07	CH11	B	Node-1	TCS	2A	AC
Pri Struct N1 RTD Zone 7-4 Meas	Node-1 Shell Zone-7 RTD-4 Meas	N1-2	A03	LLA	SL07	CH12	A	Node-1	TCS	2A	AC
Pri Struct N1 RTD Zone 8-2 Meas	Node-1 Shell Zone-8 RTD-2 Meas	N1-2	A03	LLA	SL07	CH13	B	Node-1	TCS	2A	AC
Pri Struct N1 RTD Zone 9-2 Meas	Node-1 Shell Zone-9 RTD-2 Meas	N1-2	A03	LLA	SL07	CH14	B	Node-1	TCS	2A	AC
Spare	Spare	N1-2	A03	LLA	SL07	CH15	Spare	Spare	Spare		
Spare	Spare	N1-2	A03	LLA	SL07	CH16	Spare	Spare	Spare		

N1-2 MDM Channel Assignments

Name	Description	MDM	Card Refdes	Card Type	Slot No.	Chanl No.	Chanl Type	ISS Element	OPS Position	Flight Activation	Flight Deactivation
Spare	Spare	N1-2	A03	LLA	SL07	CH17	Spare	Spare	Spare		
Pri Struct N2 RTD Zone 1-2 Meas	Node-2 Shell Zone-1 RTD-2 Meas	N1-2	A03	LLA	SL07	CH18	A	Node-2	TCS	10A	10A
Pri Struct N2 RTD Zone 8-1 Meas	Node-2 Shell Zone-1 RTD-4 Meas	N1-2	A03	LLA	SL07	CH19	B	Node-2	TCS	10A	10A
Pri Struct N2 RTD Zone 3-1 Meas	Node-2 Shell Zone-2 RTD-2 Meas	N1-2	A03	LLA	SL07	CH20	A	Node-2	TCS	10A	10A
Pri Struct N2 RTD Zone 4-1 Meas	Node-2 Shell Zone-3 RTD-2 Meas	N1-2	A03	LLA	SL07	CH21	B	Node-2	TCS	10A	10A
Pri Struct N2 RTD Zone 5-2 Meas	Node-2 Shell Zone-3 RTD-4 Meas	N1-2	A03	LLA	SL07	CH22	B	Node-2	TCS	10A	10A
Pri Struct N2 RTD Zone 6-2 Meas	Node-2 Shell Zone 4 RTD-2 Meas	N1-2	A03	LLA	SL07	CH23	A	Node-2	TCS	10A	10A
Pri Struct N2 RTD Zone 7-2 Meas	Node-2 Shell Zone-5 RTD-2 Meas	N1-2	A03	LLA	SL07	CH24	A	Node-2	TCS	10A	10A
Pri Struct N2 RTD Zone 1-4 Meas	Node-2 Shell Zone-5 RTD-4 Meas	N1-2	A03	LLA	SL07	CH25	B	Node-2	TCS	10A	10A
Prl Struct N2 RTD Zone 8-2 Meas	Node-2 Shell Zone-6 RTD-2 Meas	N1-2	A03	LLA	SL07	CH26	B	Node-2	TCS	10A	10A
Pri Struct N2 RTD Zone 3-3 Meas	Node-2 Shell Zone-6 RTD-4 Meas	N1-2	A03	LLA	SL07	CH27	A	Node-2	TCS	10A	10A
Pri Struct N2 RTD Zone 4-2 Meas	Node-2 Shell Zone-7 RTD-2 Meas	N1-2	A03	LLA	SL07	CH28	B	Node-2	TCS	10A	10A
Pri Struct N2 RTD Zone 5-4 Meas	Node-2 Shell Zone-7 RTD-4 Meas	N1-2	A03	LLA	SL07	CH29	A	Node-2	TCS	10A	10A
Pn Struct N2 RTD Zone 6-4 Meas	Node-2 Shell Zone-8 RTD-2 Meas	N1-2	A03	LLA	SL07	CH30	A	Node-2	TCS	10A	10A
Pn Struct N2 RTD Zone 7-4 Meas	Node-2 Shell Zone-9 RTD-2 Meas	N1-2	A03	LLA	SL07	CH31	B	Node-2	TCS	10A	10A
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VAV Dmpr N1-CU Pos Fdbk	Cupola Air Mix Vlv Pos Fdbk	N1-2	A12	HLA	SL08	CH00	A	LS	ECLSS	2A	AC
IMV Fan N1-Port Sply Speed Cmd	Node-1 Port IMV Fan Speed Fdbk	N1-2	A12	HLA	SL08	CH01	B	Node-1	ECLSS	2A	AC
IMV Fan N1-Stbd Rtn Speed Cmd	Node-1 Stbd IMV Fan Speed Fdbk	N1-2	A12	HLA	SL08	CH02	B	Node-1	ECLSS	2A	AC
Abs Press Xdcr N1 Meas	Node-1 Cabin Press Xdcr Meas	N1-2	A12	HLA	SL08	CH03	A	Node-1	ECLSS	2A	AC
Spare	Spare	N1-2	A12	HLA	SL08	CH04	Spare	Spare	Spare		
Spare	Spare	N1-2	A12	HLA	SL08	CH05	Spare	Spare	Spare		
Spare	Spare	N1-2	A12	HLA	SL08	CH06	Spare	Spare	Spare		
Spare	Spare	N1-2	A12	HLA	SL08	CH07	Spare	Spare	Spare		
Spare	Spare	N1-2	A12	HLA	SL08	CH08	Spare	Spare	Spare		
Spare	Spare	N1-2	A12	HLA	SL08	CH09	Spare	Spare	Spare		
Spare	Spare	N1-2	A12	HLA	SL08	CH10	Spare	Spare	Spare		
Spare	Spare	N1-2	A12	HLA	SL08	CH11	Spare	Spare	Spare		
Spare	Spare	N1-2	A12	HLA	SL08	CH12	Spare	Spare	Spare		
Spare	Spare	N1-2	A12	HLA	SL08	CH13	Spare	Spare	Spare		
Spare	Spare	N1-2	A12	HLA	SL08	CH14	Spare	Spare	Spare		
Spare	Spare	N1-2	A12	HLA	SL08	CH15	Spare	Spare	Spare		
Spare	Spare	N1-2	A12	HLA	SL08	CH16	Spare	Spare	Spare		
Spare	Spare	N1-2	A12	HLA	SL08	CH17	Spare	Spare	Spare		
Spare	Spare	N1-2	A12	HLA	SL08	CH18	Spare	Spare	Spare		
Spare	Spare	N1-2	A12	HLA	SL08	CH19	Spare	Spare	Spare		
Spare	Spare	N1-2	A12	HLA	SL08	CH20	Spare	Spare	Spare		
Spare	Spare	N1-2	A12	HLA	SL08	CH21	Spare	Spare	Spare		
Spare	Spare	N1-2	A12	HLA	SL08	CH22	Spare	Spare	Spare		
Spare	Spare	N1-2	A12	HLA	SL08	CH23	Spare	Spare	Spare		

N1-2 MDM Channel Assignments

Name	Description	MDM	Card Refdes	Card Type	Slot No.	Chanl No.	Chanl Type	ISS Element	OPS Position	Flight Activation	Flight Deactivation
Spare	Spare	N1-2	A12	HLA	SL08	CH24	Spare	Spare	Spare		
Spare	Spare	N1-2	A12	HLA	SL08	CH25	Spare	Spare	Spare		
Spare	Spare	N1-2	A12	HLA	SL08	CH26	Spare	Spare	Spare		
Spare	Spare	N1-2	A12	HLA	SL08	CH27	Spare	Spare	Spare		
Spare	Spare	N1-2	A12	HLA	SL08	CH28	Spare	Spare	Spare		
Spare	Spare	N1-2	A12	HLA	SL08	CH29	Spare	Spare	Spare		
Spare	Spare	N1-2	A12	HLA	SL08	CH30	Spare	Spare	Spare		
Spare	Spare	N1-2	A12	HLA	SL08	CH31	Spare	Spare	Spare		
SSMDM N1-1 RTD Meas	MDM PMA1-1 RTD Meas	N1-2	A02	LLA	SL09	CH00	A	PMA-1	TCS		
Press Shl PMA1 RTD-6 Meas	PMA-1 Shell RTD-6 Meas	N1-2	A02	LLA	SL09	CH01	B	PMA-1	TCS	2A	AC
Press Shl PMA1 RTD-7 Meas	PMA-1 Shell RTD-7 Meas	N1-2	A02	LLA	SL09	CH02	B	PMA-1	TCS	2A	AC
Press Shl PMA1 RTD-8 Meas	PMA-1 Shell RTD-8 Meas	N1-2	A02	LLA	SL09	CH03	A	PMA-1	TCS	2A	AC
Press Shl PMA1 RTD-9 Meas	PMA-1 Shell RTD-9 Meas	N1-2	A02	LLA	SL09	CH04	B	PMA-1	TCS		
Press Shl PMA1 RTD-10 Meas	PMA-1 Shell RTD-10 Meas	N1-2	A02	LLA	SL09	CH05	A	PMA-1	TCS	2A	AC
Psiv APAS PMA3 Htch RTD-1 Meas	PMA-3 APAS Hatch RTD-1 Meas	N1-2	A02	LLA	SL09	CH06	A	PMA-3	TCS	3A	16A
Pslv APAS PMA3 Htch RTD-2 Meas	PMA-3 APAS Hatch RTD-2 Meas	N1-2	A02	LLA	SL09	CH07	B	PMA-3	TCS	3A	16A
Psiv APAS PMA3 Htch RTD-3 Meas	PMA-3 APAS Hatch RTD-3 Meas	N1-2	A02	LLA	SL09	CH08	B	PMA-3	TCS	3A	16A
Psiv APAS PMA3 Htch RTD-4 Meas	PMA-3 APAS Hatch RTD-4 Meas	N1-2	A02	LLA	SL09	CH09	A	PMA-3	TCS	3A	16A
Press Shl PMA3 RTD-1 Meas	PMA-3 Shell RTD-1 Meas	N1-2	A02	LLA	SL09	CH10	A	PMA-3	TCS	3A	16A
Press Shl PMA3 RTD-2 Meas	PMA-3 Shell RTD-2 Meas	N1-2	A02	LLA	SL09	CH11	B	PMA-3	TCS	3A	16A
Press Shl PMA3 RTD-3 Meas	PMA-3 Shell RTD-3 Meas	N1-2	A02	LLA	SL09	CH12	A	PMA-3	TCS	3A	16A
Press Shl PMA3 RTD-4 Meas	PMA-3 Shell RTD-4 Meas	N1-2	A02	LLA	SL09	CH13	B	PMA-3	TCS	3A	16A
Press Shl PMA3 RTD-5 Meas	PMA-3 Shell RTD-5 Meas	N1-2	A02	LLA	SL09	CH14	B	PMA-3	TCS	3A	16A
Press Shl PMA3 RTD-6 Meas	PMA-3 Shell RTD-6 Meas	N1-2	A02	LLA	SL09	CH15	A	PMA-3	TCS	3A	16A
Press Shl PMA3 RTD-7 Meas	PMA-3 Shell RTD-7 Meas	N1-2	A02	LLA	SL09	CH16	B	PMA-3	TCS	3A	16A
Press Shl PMA3 RTD-8 Meas	PMA-3 Shell RTD-8 Meas	N1-2	A02	LLA	SL09	CH17	A	PMA-3	TCS	3A	16A
Press Shl PMA3 RTD-9 Meas	PMA-3 Shell RTD-9 Meas	N1-2	A02	LLA	SL09	CH18	A	PMA-3	TCS	3A	16A
Press Shl PMA3 RTD-10 Meas	PMA-3 Shell RTD-10 Meas	N1-2	A02	LLA	SL09	CH19	B	PMA-3	TCS	3A	16A
Spare	Spare	N1-2	A02	LLA	SL09	CH20	Spare	Spare	Spare		
Spare	Spare	N1-2	A02	LLA	SL09	CH21	Spare	Spare	Spare		
CMGEA-1 RTD-1 Meas	CMGEA-1 RTD-1 Meas	N1-2	A02	LLA	SL09	CH22	B	FGB	MCS		
CMGEA-1 RTD-2 Meas	CMGEA-1 RTD-2 Meas	N1-2	A02	LLA	SL09	CH23	A	ITS-Z1	MCS		
CMGEA-4 RTD-1 Meas	CMGEA-4 RTD-1 Meas	N1-2	A02	LLA	SL09	CH24	A	ITS-Z1	MCS		
CMGEA-4 RTD-2 Meas	CMGEA-4 RTD-2 Meas	N1-2	A02	LLA	SL09	CH25	B	ITS-Z1	MCS		
Spare	Spare	N1-2	A02	LLA	SL09	CH26		Spare	Spare		
Spare	Spare	N1-2	A02	LLA	SL09	CH27		Spare	Spare		
SPDA Z1-3B Util Rail RTD-2 Meas	SPDA Z1-3B Util Rail RTD-2 Meas	N1-2	A02	LLA	SL09	CH28	B	ITS-Z1	EPS		
Spare	Spare	N1-2	A02	LLA	SL09	CH29	Spare	Spare	Spare		
Spare	Spare	N1-2	A02	LLA	SL09	CH30	Spare	Spare	Spare		

N1-2 MDM Channel Assignments

Name	Description	MDM	Card Refdes	Card Type	Slot No.	Chnl No.	Chnl Type	ISS Element	OPS Position	Flight Activation	Flight Deactivation
SPDA Z1-4B Util Rail RTD-1 Meas	SPDA Z1-4B Util Rail RTD-1 Meas	N1-2	A02	LLA	SL09	CH31	B	ITS-Z1	EPS		

NCS C&W EVENT TABLE

System	Message Text	Class	Element	SubSystem	P2 PUI	Event Code	Event Driver	Analog Limit Low	Analog Limit High	Discrete Value 0=	Discrete Value 1=	Limit Location PPL ID and/or Cmd	Flight Effectivity
CDH	Prime NCS Detected RT Fail SMCC-3 - SM	C	SM	SMCC 3	M1DP47MDX005U	159				Nominal	In Alarm		2A.1 +
CDH	Prime NCS Detected RT Fail SMCC-2 - SM	C	SM	SMCC 2	M1DP47MDX007U	161				Nominal	In Alarm		2A.1 +
CDH	Prime NCS Detected RT Fail SMCC-1 - SM	C	SM	SMCC 1	M1DP47MDX009U	163				Nominal	In Alarm		2A.1 +
CDH	Prime NCS Detected RT Fail MDM FGB-2 - FGB	C	FGB	FGB MDM 2	M1DP47MDX011U	165				Nominal	In Alarm		2A +
CDH	Prime NCS Detected RT Fail MDM FGB-1 - FGB	C	FGB	FGB MDM 1	M1DP47MDX013U	167				Nominal	In Alarm		2A +
CDH	MDM N1-1 Detected RT Fail MDM N1-2 - PMA 1	C	PMA1	Nod1 2 MDM	M1DS47MDX012U	7				Nominal	In Alarm		2A +
CDH	MDM N1-1 User Bus Orb N1-1 Fail - NOD1	C	PMA1	Nod1 1 MDM	M1DS47MDX014U	9				Nominal	In Alarm		2A +
CDH	MDM N1-2 Detected RT Fail MDM N1-1 - PMA 1	C	PMA1	Nod1 1 MDM	M1DS48MDX004U	67				Nominal	In Alarm		2A +
CDH	MDM N1-2 User Bus Orb N1-2 Fail - NOD1	C	PMA1	Nod1 2 MDM	M1DS48MDX014U	77				Nominal	In Alarm		2A +
CDH	Prime NCS Detected RT Fail OIU - Shuttle	C	N/A	OIU	M1DP47MDX111U	171				Nominal	In Alarm		2A +
CDH	Prime NCS Detected Vusy Bit Fail for SMCC - SM	C	SM	SMCC	M1DP47MDX019U	246				Nominal	In Alarm		2A.1 +
CDH	Prime NCS Detected Frame Count Fail for SMCC - SM	C	SM	SMCC	M1DP47MDX020U	247				Nominal	In Alarm		2A.1 +
CDH	Prime NCS Loss of Sync to SMCC - SM	C	SM	SMCC	M1DP47MDX021U	248				Nominal	In Alarm		2A.1 +
CDH	Prime NCS User Bus EPS N1-23 Fail - NOD1	A	PMA1	Prim NCS	M1DP47MDX014U	168				Nominal	In Alarm		2A +
CDH	Prime NCS User Bus EPS N1-14 Fail - NOD1	A	PMA1	Prim NCS	M1DP47MDX015U	169				Nominal	In Alarm		2A +
CDH	MDM N1-1 Loss of Sync to MDM N1-2 - PMA 1	A	PMA1	Nod1 2 MDM	M1DS47MDX011U	6				Nominal	In Alarm		2A +
CDH	MDM N1-1 Control Bus GNC 1 Fail - NOD1	A	PMA1	Nod1 1 MDM	M1DS47MDX013U	8				Nominal	In Alarm		2A +
CDH	MDM N1-1 Local Bus Sys Lab 1 Fail - NOD1	A	PMA1	Nod1 1 MDM	M1DS47MDX015U	10				Nominal	In Alarm		2A +
CDH	MDM N1-2 Operational Heater Failed - Node 1	A	PMA1	Nod1 1 MDM	M1DS47MDX301U	41	MDM N1-2 RTD2 Meas			< or = -45 deg F or > or = +120 deg F			2A +
CDH	MDM N1-2 Survival Heater Failed - Node 1	A	PMA1	Nod1 2 MDM	M1DS47MDX312U	52	MDM N1-2 RTD1 Meas			< or = -45 deg F or > or = +120 deg F			2A +

NCS C&W EVENT TABLE

System	Message Text	Class	Element	SubSystem	P2 PUI	Event Code	Event Driver	Analog Limit Low	Analog Limit High	Discrete Value 0=	Discrete Value 1=	Limit Location PPL ID and/or Cmd	Flight Effectivity
CDH	MDM N1-2 Loss of Sync to MDM N1-1 - PMA 1	A	PMA1	Nod1 1 MDM	M1DS48MDX003U	66				Nominal	In Alarm		2A+
CDH	MDM N1-2 Control Bus GNC 2 Fail - NOD1	A	PMA1	Nod1 2 MDM	M1DS48MDX013U	76				Nominal	In Alarm		2A +
CDH	MDM N1-2 Local Bus Sys Lab 2 Fail - NOD1	A	PMA1	Nod1 2 MDM	M1DS48MDX015U	78				Nominal	In Alarm		2A +
CDH	MDM N1-1 Operational Heater Failed - NODE 1	A	PMA1	Nod1 2 MDM	M1DS48MDX303U	119	MDM N1-1 RTD2 Meas			< or = -45 deg F or > or = +120 deg F			2A +
CDH	MDM N1-1 Survival Heater Failed - Node 1	A	PMA1	Nod1 1 MDM	M1DS48MDX408U	132	MDM N1-1 RTD1 Meas			Nominal	< or = -45 deg F or > or = +120 deg F		2A +
CDH	TLM System Off - FGB	A	FGB	TLM	RFCC00MD0500J	257				Nominal	Failed		2A +
CDH	Prime NCS Loss of Sync to SMCC - SM	A	SM	SMCC	M1DP47MDX016U	249				Nominal	In Alarm		2A.1 +
CDH	Prime NCS Detected Busy Bit Fail for SMCC - SM	A	SM	SMCC	M1DP47MDX017U	250				Nominal	In Alarm		2A.1 +
CDH	Prime NCS Detected Frame Count Fail for SMCC - SM	A	FGB	SMCC	M1DP47MDX018U	251				Nominal	In Alarm		2A.1 +
ECL	Cabin Fan Fail - NOD1	W	NOD1	Nod1_Cab_Fan	M1DS47MDX209U	34	Node 1 Cab Fan Speed	< 3200 rpm (3X @ 1 Hz)	> 7000 rpm (3X @ 1 Hz)	N/A	N/A		2A +
ECL	Cabin Press Hi - NOD1	W	NOD1	Nod1_Cab_Press_Snsr	M1DS48MDX208U	103	Node 1 Cab Press	N/A	15.2 psia (3X @ 1 Hz)	N/A	N/A		2A +
ECL	Cabin Press Low - NOD1	W	NOD1	Nod1_Cab_Press_Snsr	M1DS48MDX209U	104	Node 1 Cab Press	13.9 psia (3X @ 1 Hz)	N/A	N/A	N/A		2A +
ECL	Cabin Press Low - FGB	W	FGB	FGB_Press_Snsr	RFEC00MD0007J	239	FGB WC Cab Press	TBD	N/A	N/A	N/A		2A +
ECL	Cabin Press Hi - FGB	W	FGB	FGB_Press_Snsr	RFEC00MD0008J	240	FGB WC Cab Press	N/A	TBD	N/A	N/A		2A +
ECL	FIRE - Smoke Detector Level 1 - FGB	W	FGB	FGB_SD	RFEC00MD0031J	255	FGB SDx Level 1	N/A	N/A	All FGB SD have Level 1 = blank (normal)	1+ FGB SD have Level 1 = X (In Alarm)		2A +

NCS C&W EVENT TABLE

System	Message Text	Class	Element	SubSystem	P2 PUI	Event Code	Event Driver	Analog Limit Low	Analog Limit High	Discrete Value 0=	Discrete Value 1=	Limit Location PPL ID and/or Cmd	Flight Effectivity
ECL	FIRE - Smoke Detector 1 - NOD1	F	NOD1	Nod1_SD_1	M1DS47MDX210U	35	Node 1 SD 1 Sctr > Sctr Threshold 3X @ 1 Hz, with 3 second Active BIT between second and third measurements. Sctr Threshold = (Sctr Trip) * ((Obs+4.0v)/8.0v)	N/A	N/A	N/A	N/A		2A +
ECL	FIRE - Smoke Detector 2 - NOD1	F	NOD1	Nod1_SD_2	M1DS48MDX210U	105	Node 1 SD 2 Sctr > Sctr Threshold 3X @ 1 Hz, with 3 second Active BIT between second and third measurements. Sctr Threshold = (Sctr Trip) * ((Obs+4.0v)/8.0v)	N/A	N/A	N/A	N/A		2A +
ECL	FIRE - Smoke Detector Level 2 - FGB	F	FGB	FGB_SD	RFEC00MD0001J	241	FGB SDx Level 2	N/A	N/A	0 or 1 FGB SD have Level 2 = X (In Alarm)	2+ FGB SD have Level 2 = X (In Alarm)		2A +
ECL	IMV Aft Port Fan Fail Low - NOD1	C	NOD1	Nod1_Aft_Port_IM_V_Fan	M1DS47MDX201U	27	IMV Aft Port Fan Spd	<7462 rpm (3X)	N/A	N/A	N/A		2A +
ECL	IMV Aft Port Fan Fail Hi - NOD1	C	NOD1	Nod1_Aft_Port_IM_V_Fan	M1DS47MDX202U	28	IMV Aft Port Fan Spd	> 9500 rpm (3X)	N/A	N/A	N/A		2A +
ECL	IMV Aft Port Vlv Fail - NOD1	C	NOD1	Nod1_Aft_Port_IM_V_Vlv	M1DS47MDX203U	29	IMV Aft Port Vlv Status ≠ commanded position after 20 seconds.	N/A	N/A	N/A	N/A		2A +
ECL	IMV Aft Stbd Vlv Fail - NOD1	C	NOD1	Nod1_Aft_Stbd_IM_V_Vlv	M1DS47MDX204U	30	IMV Aft Stbd Vlv Status ≠ commanded position after 20 seconds.	N/A	N/A	N/A	N/A		2A +
ECL	IMV Port Fwd Vlv Fail - NOD1	C	NOD1	Nod1_Port_Fwd_IM_V_Vlv	M1DS47MDX205U	31	IMV Port Fwd Vlv Status ≠ commanded position after 20 seconds.	N/A	N/A	N/A	N/A		2A +
ECL	IMV Stbd Aft Vlv Fail - NOD1	C	NOD1	Nod1_Stbd_Aft_IM_V_Vlv	M1DS47MDX206U	32	IMV Stbd Aft Vlv Status ≠ commanded position after 20 seconds.	N/A	N/A	N/A	N/A		2A +
ECL	IMV Stbd Fwd Vlv Fail - NOD1	C	NOD1	Nod1_Stbd_Fwd_IM_V_Vlv	M1DS47MDX207U	33	IMV Stbd Fwd Vlv Status ≠ commanded position after 20 seconds.	N/A	N/A	N/A	N/A		2A +

NCS C&W EVENT TABLE

System	Message Text	Class	Element	SubSystem	P2 PUI	Event Code	Event Driver	Analog Limit Low	Analog Limit High	Discrete Value 0=	Discrete Value 1=	Limit Location PPL ID and/or Cmd	Flight Effectivity
ECL	Smoke Detector 1 Active BIT Fail - NOD1	C	NOD1	Nod1_SD_1	M1DS47MDX211U	36	SD 1 Active BIT in Progress and one of the following: Sctr > 6.89 % obsc/mtr or Sctr < 2.95 %obsc/mtr during LED phase, Sctr > 0.82 % obsc/mtr or Sctr < -0.328 % obsc/mtr during QUIET phase, or Obsc > 97.5% contam in either phase.	N/A	N/A	N/A	N/A		2A +
ECL	Smoke Detector 1 Lens Contamination - NOD1	C	NOD1	Nod1_SD_1	M1DS47MDX213U	38	SD 1 Obsc > 45% contam (3X)	N/A	N/A	N/A	N/A		2A +
ECL	RAMV Fail - NOD1	C	NOD1	Nod1_RAMV	M1DS47MDX215U	40	Node 1 RAMV Status is more than \pm 5 degrees from desired position after 30 seconds.	N/A	N/A	N/A	N/A		2A +
ECL	IMV Deck Fwd Vlv Fail - NOD1	C	NOD1	Nod1_Deck_Fwd_IMV_Vlv	M1DS48MDX204U	99	IMV Deck Fwd Vlv Status \neq commanded position after 20 seconds.	N/A	N/A	N/A	N/A		2A +
ECL	IMV Deck Aft Vlv Fail - NOD1	C	NOD1	Nod1_Deck_Aft_IMV_Vlv	M1DS48MDX205U	100	IMV Deck Aft Vlv Status \neq commanded position after 20 seconds.	N/A	N/A	N/A	N/A		2A +
ECL	IMV Fwd Stbd Vlv Fail - NOD1	C	NOD1	Nod1_Fwd_Stbd_IMV_Vlv	M1DS48MDX206U	101	IMV Fwd Stbd Vlv Status \neq commanded position after 20 seconds.	N/A	N/A	N/A	N/A		2A +
ECL	IMV Fwd Port Vlv Fail - NOD1	C	NOD1	Nod1_Fwd_Port_IMV_Vlv	M1DS48MDX207U	102	IMV Fwd Port Vlv Status \neq commanded position after 20 seconds.	N/A	N/A	N/A	N/A		2A +

NCS C&W EVENT TABLE

System	Message Text	Class	Element	SubSystem	P2 PUI	Event Code	Event Driver	Analog Limit Low	Analog Limit High	Discrete Value 0=	Discrete Value 1=	Limit Location PPL ID and/or Cmd	Flight Effectivity
ECL	Smoke Detector 2 Active BIT Fail - NOD1	C	NOD1	Nod1_SD_2	M1DS48MDX211U	106	SD 2 Active BIT in Progress and one of the following: Sctr > 6.89 % obsc/mtr or Sctr < 2.95 %obsc/mtr during LED phase, Sctr > 0.82 % obsc/mtr or Sctr < -0.328 % obsc/mtr during QUIET phase, or Obsc > 97.5% contam in either phase.	N/A	N/A	N/A	N/A		2A +
ECL	Smoke Detector 2 Lens Contamination - NOD1	C	NOD1	Nod1_SD_2	M1DS48MDX213U	108	SD 1 Obsc > 45% contam (3X)	N/A	N/A	N/A	N/A		2A +
ECL	Cupola RAMV Fail - NOD1	C	NOD1	Nod1_Cup_RAMV	M1DS48MDX215U	110	CUP RAMV Status is more than \pm 5 degrees from desired position after 30 seconds.	N/A	N/A	N/A	N/A		2A +
ECL	Smoke Detector 2 Fail - NOD1	C	NOD1	Nod1_SD_2	M1DS48MDX212U	107	SD 1 Sctr < -0.328 % obs/mtr or SD obsc > 50% contam or SD obsc < -2.5 % contam (2X for each event)	N/A	N/A	N/A	N/A		2A +
ECL	IMV Stbd Aft Fan Fail Low - NOD1	C	NOD1	Nod1_Stbd_Aft_IMV_Fan	M1DS48MDX202U	97	IMV Stbd Aft Fan Spd	< 7462 rpm (3X)	N/A	N/A	N/A		2A +
ECL	IMV Port Fwd Fan Fail Low - NOD1	C	NOD1	Nod1_Port_Fwd_IMV_Fan	M1DS48MDX200U	95	IMV Port Fwd Fan Spd	< 7462 rpm (3X)	N/A	N/A	N/A		2A +
ECL	IMV Stbd Aft Fan Fail Hi - NOD1	C	NOD1	Nod1_Stbd_Aft_IMV_Fan	M1DS48MDX203U	98	IMV Stbd Aft Fan Spd	> 9500 rpm (3X)	N/A	N/A	N/A		2A +
ECL	IMV Port Fwd Fan Fail Hi - NOD1	C	NOD1	Nod1_Port_Fwd_IMV_Fan	M1DS48MDX201U	96	IMV Port Fwd Fan Spd	> 9500 rpm (3X)	N/A	N/A	N/A		2A +
ECL	Smoke Detector 1 Fail - NOD1	C	NOD1	Nod1_SD_1	M1DS47MDX212U	37	SD 1 Sctr < -0.328 % obs/mtr or SD obsc > 50% contam or SD obsc < -2.5 % contam (2X for each event)	N/A	N/A	N/A	N/A		2A +
ECL	IMV Aft Port Fan FDIR Inhib - NOD1	A	NOD1	Nod1_Aft_Port_IMV_Fan	M1DS47MDX214U	39	Receipt of IMV Aft Port Fan FDIR Inh and Inh Cfrm cmd and IMV_Aft_Port_Fan_Status = Inh	N/A	N/A	N/A	N/A		2A +
ECL	IMV Stbd Aft Fan FDIR Inhib - NOD1	A	NOD1	Nod1_Stbd_Aft_IMV_Fan	M1DS48MDX214U	109	Receipt of IMV Stbd Aft Fan FDIR Inh and Inh Cfrm cmd and IMV_Stbd_Aft_Fan_Status = Inh	N/A	N/A	N/A	N/A		2A +

NCS C&W EVENT TABLE

System	Message Text	Class	Element	SubSystem	P2 PUI	Event Code	Event Driver	Analog Limit Low	Analog Limit High	Discrete Value 0=	Discrete Value 1=	Limit Location PPL ID and/or Cmd	Flight Effectivity
ECL	INVALID - FIRE - Smoke Detector Level 2 - FGB	A	FGB	FGB_SD	RFEC00MD0030J	252	FGB_Fire_Valid_CW set to INVALID. This can be done by MCC-M to indicate bad data feeding this alarm, or by the FGB MDM receiving a bad status indicator for the data message containing this event.	N/A	N/A	Valid	Invalid		2A +
ECL	INVALID - FIRE - Smoke Detector Level 1 - FGB	A	FGB	FGB_SD	RFEC00MD0029J	253	FGB_Smoke_Valid_CW set to INVALID. This can be done by MCC-M to indicate bad data feeding this alarm, or by the FGB MDM receiving a bad status indicator for the data message containing this event.	N/A	N/A	Valid	Invalid		2A +
ECL	INVALID - Cab Press Hi - FGB	A	FGB	FGB_Press_Snsr	RFEC00MD0012J	254	FGB_Cab_Press_UL_VI ol_Valid_CW set to INVALID. This can be done by MCC-M to indicate bad data feeding this alarm, or by the FGB MDM receiving a bad status indicator for the data message containing this event.	N/A	N/A	Valid	Invalid		2A +
ECL	IMV Port Fwd Fan FDIR Inhib - NOD1	A	NOD1	Nod1_Port_Fwd_IMV_Fan	M1DS48MDX302U	245	Receipt of IMV Port Fwd Fan FDIR Inh and Inh Cfrm cmd and IMV_Port_Fwd_Fan_Status = Inh	N/A	N/A	N/A	N/A		2A +

NCS C&W EVENT TABLE

System	Message Text	Class	Element	SubSystem	P2 PUI	Event Code	Event Driver	Analog Limit Low	Analog Limit High	Discrete Value 0=	Discrete Value 1=	Limit Location PPL ID and/or Cmd	Flight Effectivity
ECL	INVALID - Cab Press Low - FGB	A	FGB	FGB_Press_Snsr	RFEC00MD0011J	256	FGB_Cab_Press_LL_Viol_Valid_CW set to INVALID. This can be done by MCC-M to indicate bad data feeding this alarm, or by the FGB MDM receiving a bad status indicator for the data message containing this event.	N/A	N/A	Valid	Invalid		2A +
ECL	Air Temp Hi - FGB	A	FGB	N/A (alarm covers all temps)	RFTC00MD0004J	258	TBD	N/A	TBD	N/A	N/A		2A +
ECL	Air Temp Low - FGB	A	FGB	N/A (alarm covers all temps)	RFTC00MD0003J	259	TBD	TBD	N/A	N/A	N/A		2A +
EPS	FGB Power Utilization Violation - Load Shed Initiated - NOD1	C	FGB	FGB_Batt	M1DP47MDX110U	170	Low voltage on 3 FGB Batteries			Volts < or = 25.5	Volts > 25.5		
EPS	RPCM N1RS1_C Loss of Comm - NOD1	A	NOD1	RPCM N1RS1_C	M1DP47MDX202U	178	Intgrtn_Ctr N1PN11FC0617U			Static	Incre-menting		
EPS	RPCM N1RS1_B Loss of Comm - NOD1	A	NOD1	RPCM N1RS1_B	M1DP47MDX203U	179	Intgrtn_Ctr N1PN10FC0617U			Static	Incre-menting		
EPS	RPCM N1RS1_A Loss of Comm - NOD1	A	NOD1	RPCM N1RS1_A	M1DP47MDX204U	180	Intgrtn_Ctr N1PN09FC0617U			Static	Incre-menting		
EPS	RPCM N1RS2_C Loss of Comm - NOD1	A	NOD1	RPCM N1RS2_C	M1DP47MDX207U	183	Intgrtn_Ctr N1PN15FC0617U			Static	Incre-menting		
EPS	RPCM N1RS2_B Loss of Comm - NOD1	A	NOD1	RPCM N1RS2_B	M1DP47MDX208U	184	Intgrtn_Ctr N1PN14FC0617U			Static	Incre-menting		
EPS	RPCM N1RS2_A Loss of Comm - NOD1	A	NOD1	RPCM N1RS2_A	M1DP47MDX209U	185	Intgrtn_Ctr N1PN13FC0617U			Static	Incre-menting		
EPS	RPCM N1RS1_C Trip - NOD1	A	NOD1	RPCM N1RS1_C	M1DP47MDX302U	194	RPCM_N1RS1_C_RPC _XX_Trip_Stat,RPCM_N1RS1_C_Undvolt_Trip_Awaitg_Rcvy, RPCM_N1RS1_C_Undvolt_Trip						
EPS	RPCM N1RS1_B Trip - NOD1	A	NOD1	RPCM N1RS1_B	M1DP47MDX303U	195	RPCM_N1RS1_B_RPC _XX_Trip_Stat,RPCM_N1RS1_B_Undvolt_Trip_Awaitg_Rcvy, RPCM_N1RS1_B_Undvolt_Trip						

NCS C&W EVENT TABLE

System	Message Text	Class	Element	SubSystem	P2 PUI	Event Code	Event Driver	Analog Limit Low	Analog Limit High	Discrete Value 0=	Discrete Value 1=	Limit Location PPL ID and/or Cmd	Flight Effectivity
EPS	RPCM N1RS1_A Trip - NOD1	A	NOD1	RPCM N1RS1_A	M1DP47MDX304U	196	RPCM_N1RS1_A_RPC_XX_Trip_Stat,RPCM_N1RS1_A_Undvolt_Trip_Awaitg_Rcvy, RPCM_N1RS1_A_Undvolt_Trip						
EPS	RPCM N1RS2_C Trip - NOD1	A	NOD1	RPCM N1RS2_C	M1DP47MDX307U	199	RPCM_N1RS2_C_RPC_XX_Trip_Stat,RPCM_N1RS2_C_Undvolt_Trip_Awaitg_Rcvy, RPCM_N1RS2_C_Undvolt_Trip			nominal	Trip		
EPS	RPCM N1RS2_B Trip - NOD1	A	NOD1	RPCM N1RS2_B	M1DP47MDX308U	200	RPCM_N1RS2_B_RPC_XX_Trip_Stat,RPCM_N1RS2_B_Undvolt_Trip_Awaitg_Rcvy, RPCM_N1RS2_B_Undvolt_Trip						
EPS	RPCM N1RS2_A Trip - NOD1	A	NOD1	RPCM N1RS2_A	M1DP47MDX309U	201	RPCM_N1RS2_A_RPC_XX_Trip_Stat,RPCM_N1RS2_A_Undvolt_Trip_Awaitg_Rcvy, RPCM_N1RS2_A_Undvolt_Trip						
EPS	RPCM N14B_C Trip - NOD1	A	NOD1	RPCM N14B_C	M1DS47MDX102U	13	RPCM_N14B_C_RPC_XX_Trip_Stat,RPCM_N14B_C_Undvolt_Trip_Awaitg_Rcvy, RPCM_N14B_C_Undvolt_Trip			nominal	Trip		
EPS	RPCM N14B_B Trip - NOD1	A	NOD1	RPCM N14B_B	M1DS47MDX103U	14	RPCM_N14B_B_RPC_XX_Trip_Stat,RPCM_N14B_B_Undvolt_Trip_Awaitg_Rcvy, RPCM_N14B_B_Undvolt_Trip			nominal	Trip		
EPS	RPCM N14B_A Trip - NOD1	A	NOD1	RPCM N14B_A	M1DS47MDX104U	15	RPCM_N14B_A_RPC_XX_Trip_Stat,RPCM_N14B_A_Undvolt_Trip_Awaitg_Rcvy, RPCM_N14B_A_Undvolt_Trip			nominal	Trip		
EPS	RPCM N14B_C Loss of Comm - NOD1	A	NOD1	RPCM N14B_C	M1DS47MDX107U	18	Intgrtn_Ctr N1PN07FC0617U			Static	Incre-menting		
EPS	RPCM N14B_B Loss of Comm - NOD1	A	NOD1	RPCM N14B_B	M1DS47MDX108U	19	Intgrtn_Ctr N1PN06FC0617U			Static	Incre-menting		

NCS C&W EVENT TABLE

System	Message Text	Class	Element	SubSystem	P2 PUI	Event Code	Event Driver	Analog Limit Low	Analog Limit High	Discrete Value 0=	Discrete Value 1=	Limit Location PPL ID and/or Cmd	Flight Effectivity
EPS	RPCM N14B_A Loss of Comm - NOD1	A	NOD1	RPCM N14B_A	M1DS47MDX109U	20	Intgrtn_Ctr N1PN05FC0617U			Static	Incre-menting		
EPS	RPCM N13B_C Trip - NOD1	A	NOD1	RPCM N13B_C	M1DS48MDX102U	81	RPCM_N13B_C_RPC_XX_Trip_Stat,RPCM_N13B_C_Undvolt_Trip_Aw aitg_Rcvy, RPCM_N13B_C_Undvolt_Trip			nominal	Trip		
EPS	RPCM N13B_B Trip - NOD1	A	NOD1	RPCM N13B_B	M1DS48MDX103U	82	RPCM_N13B_B_RPC_XX_Trip_Stat,RPCM_N13B_B_Undvolt_Trip			nominal	Trip		
EPS	RPCM N13B_A Trip - NOD1	A	NOD1	RPCM N13B_A	M1DS48MDX104U	83	RPCM_N13B_A_RPC_XX_Trip_Stat,RPCM_N13B_A_Undvolt_Trip			nominal	Trip		
EPS	RPCM N13B_C Loss of Comm - NOD1	A	NOD1	RPCM N13B_C	M1DS48MDX107U	86	Intgrtn_Ctr N1PN03FC0617U			Static	Incre-menting		
EPS	RPCM N13B_B Loss of Comm - NOD1	A	NOD1	RPCM N13B_B	M1DS48MDX108U	87	Intgrtn_Ctr N1PN02FC0617U			Static	Incre-menting		
EPS	RPCM N13B_A Loss of Comm - NOD1	A	NOD1	RPCM N13B_A	M1DS48MDX109U	88	Intgrtn_Ctr N1PN01FC0617U			Static	Incre-menting		
EPS	SPDA Z13B Heater A Failed - Z1	A	Z1	HTR	M1DS47MDX400U	56							3A +
EPS	SPDA Z14B Heater A Failed - Z1	A	Z1	HTR	M1DS47MDX401U	57							3A +
EPS	SPDA Z13B Heater B Failed - Z1	A	Z1	HTR	M1DS48MDX410U	134							3A +
EPS	SPDA Z14B Heater B Failed - Z1	A	Z1	HTR	M1DS48MDX411U	135							3A +
EPS	RPCM Z14B_B Loss of Comm - Z1	A	Z1	RPCM Z14B_B	M1DP47MDX200U	176							3A +
EPS	RPCM Z14B_A Loss of Comm - Z1	A	Z1	RPCM Z14B_A	M1DP47MDX201U	177							3A +
EPS	RPCM Z13B_B Loss of Comm - Z1	A	Z1	RPCM Z13B_B	M1DP47MDX205U	181							3A +
EPS	RPCM Z13B_A Loss of Comm - Z1	A	Z1	RPCM Z13B_A	M1DP47MDX206U	182							3A +
EPS	RPCM Z14B_B Trip - Z1	A	Z1	RPCM Z14B_B	M1DP47MDX300U	192							3A +
EPS	RPCM Z14B_A Trip - Z1	A	Z1	RPCM Z14B_A	M1DP47MDX301U	193							3A +
EPS	RPCM Z13B_B Trip - Z1	A	Z1	RPCM Z13B_B	M1DP47MDX305U	197							3A +
EPS	RPCM Z13B_A Trip - Z1	A	Z1	RPCM Z13B_A	M1DP47MDX306U	198							3A +
EPS	RPCM LAB1D1_F_A Trip - Lab	A	LAB	LAB1D1_F_A	M1DS47MDX100U	11							3A +
EPS	RPCM LF_A Trip - Lab	A	LAB	RPCM LF_A	M1DS47MDX101U	12							3A +
EPS	RPCM LAB1D1_F_A Loss of Comm - Lab	A	LAB	RPCM LAB1D1_F_A	M1DS47MDX105U	16							3A +
EPS	RPCM LF_A Loss of Comm - Lab	A	LAB	RPCM LF_A	M1DS47MDX106U	17							3A +
EPS	RPCM LAB1D5_A_A Trip - Lab	A	LAB	RPCM LAB1D5_A_A	M1DS48MDX100U	79							3A +

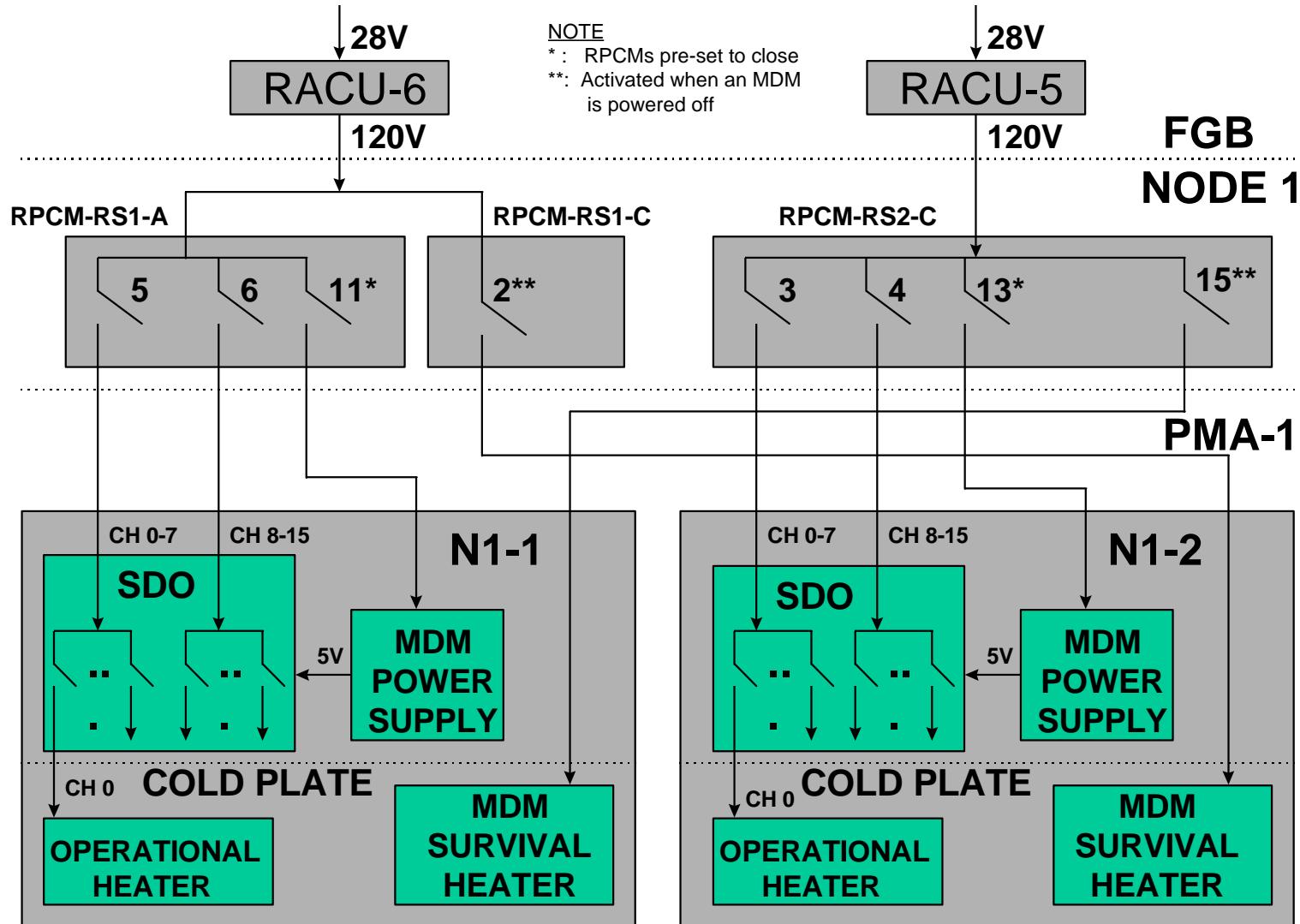
NCS C&W EVENT TABLE

System	Message Text	Class	Element	SubSystem	P2 PUI	Event Code	Event Driver	Analog Limit Low	Analog Limit High	Discrete Value 0=	Discrete Value 1=	Limit Location PPL ID and/or Cmd	Flight Effectivity
EPS	RPCM LA_A Trip - Lab	A	LAB	RPCM LA_A	M1DS48MDX101U	80							3A +
EPS	RPCM LAB1D5_A_A Loss of Comm - Lab	A	LAB	RPCM LAB1D5_A_A	M1DS48MDX105U	84							3A +
EPS	RPCM LA_A Loss of Comm - Lab	A	LAB	RPCM LA_A	M1DS48MDX106U	85							3A +
SNM	CBM-Rapid-Safing-Failure - NOD1	C	NOD1	CBM	M1DP47MDX112U	172	CBM Rapid Safing Fails to complete.			Normal	Tripped		2A +
SNM	CBM-Rapid-Safing-in-Progress - NOD1	C	NOD1	CBM	M1DP47MDX113U	173	CBM Rapid Safing command issued.			Normal	Tripped		2A +
SNM	CBM FORWARD Primary RT Fail - NOD1	A	NOD1	CBM	M1DS47MDX006U	1	MDM to RT Communication Failure			Normal	Tripped		2A +
SNM	CBM PORT Primary RT Fail - NOD1	A	NOD1	CBM	M1DS47MDX007U	2	MDM to RT Communication Failure			Normal	Tripped		2A +
SNM	CBM DECK Primary RT Fail - NOD1	A	NOD1	CBM	M1DS47MDX008U	3	MDM to RT Communication Failure			Normal	Tripped		2A +
SNM	CBM STARBOARD Primary RT Fail - NOD1	A	NOD1	CBM	M1DS47MDX009U	4	MDM to RT Communication Failure			Normal	Tripped		2A +
SNM	CBM ZENITH Primary RT Fail - NOD1	A	NOD1	CBM	M1DS47MDX010U	5	MDM to RT Communication Failure			Normal	Tripped		2A +
SNM	CBM FORWARD Secondary RT Fail - NOD1	A	NOD1	CBM	M1DS48MDX005U	68	MDM to RT Communication Failure			Normal	Tripped		2A +
SNM	CBM PORT Secondary RT Fail - NOD1	A	NOD1	CBM	M1DS48MDX006U	69	MDM to RT Communication Failure			Normal	Tripped		2A +
SNM	CBM DECK Secondary RT Fail - NOD1	A	NOD1	CBM	M1DS48MDX007U	70	MDM to RT Communication Failure			Normal	Tripped		2A +
SNM	CBM STARBOARD Secondary RT Failure - NOD1	A	NOD1	CBM	M1DS48MDX008U	71	MDM to RT Communication Failure			Normal	Tripped		2A +
SNM	CBM ZENITH Secondary RT Fail - NOD1	A	NOD1	CBM	M1DS48MDX009U	72	MDM to RT Communication Failure			Normal	Tripped		2A +
TCS	Node 1 Heater 1A Failed - Node 1	A	NOD1	HTR	M1DS47MDX302U	42							
TCS	Node 1 Heater 2A Failed - Node 1	A	NOD1	HTR	M1DS47MDX303U	43							
TCS	Node 1 Heater 3A Failed - Node 1	A	NOD1	HTR	M1DS47MDX304U	44							
TCS	Node 1 Heater 4A Failed - Node 1	A	NOD1	HTR	M1DS47MDX305U	45							
TCS	Node 1 Heater 5A Failed - Node 1	A	NOD1	HTR	M1DS47MDX306U	46							
TCS	Node 1 Heater 6A Failed - Node 1	A	NOD1	HTR	M1DS47MDX307U	47							
TCS	Node 1 Heater 7A Failed - Node 1	A	NOD1	HTR	M1DS47MDX308U	48							
TCS	Node 1 Heater 8A Failed - Node 1	A	NOD1	HTR	M1DS47MDX309U	49							
TCS	Node 1 Heater 9A Failed - Node 1	A	NOD1	HTR	M1DS47MDX310U	50							
TCS	PMA1 Heater 1A Failed - PMA1	A	PMA1	HTR	M1DS47MDX311U	51							
TCS	PMA1 Heater 3A Failed - PMA1	A	PMA1	HTR	M1DS47MDX313U	53							
TCS	PMA1 Heater 4A Failed - PMA1	A	PMA1	HTR	M1DS47MDX314U	54							
TCS	PMA1 Heater 5A Failed - PMA1	A	PMA1	HTR	M1DS47MDX315U	55							
TCS	Cupola Win Heater 7A Failed - Cupola	A	CUP	HTR	M1DS48MDX304U	111							
TCS	Cupola Win Heater 7B Failed - Cupola	A	CUP	HTR	M1DS48MDX305U	112							

NCS C&W EVENT TABLE

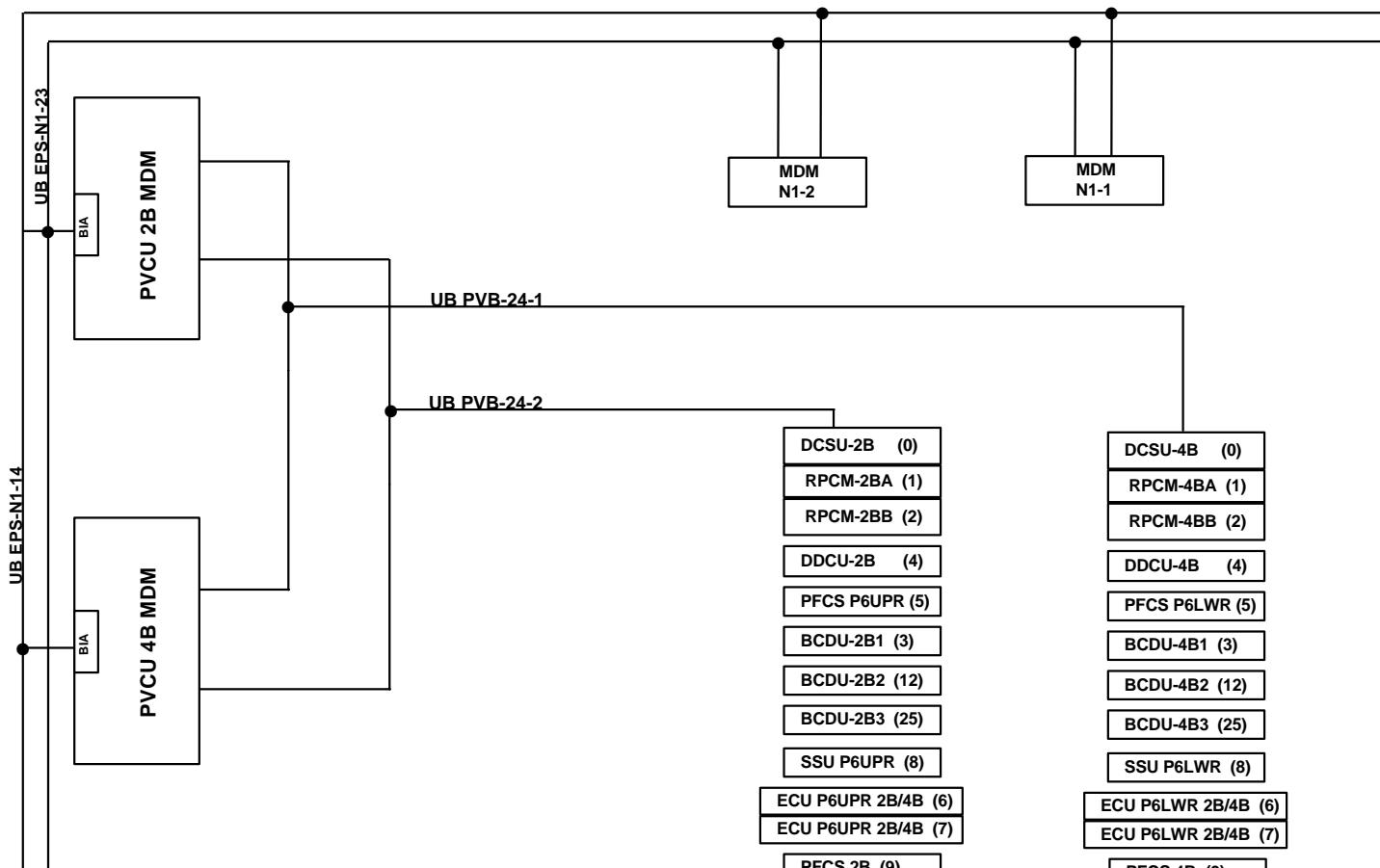
System	Message Text	Class	Element	SubSystem	P2 PUI	Event Code	Event Driver	Analog Limit Low	Analog Limit High	Discrete Value 0=	Discrete Value 1=	Limit Location PPL ID and/or Cmd	Flight Effectivity
TCS	Cupola Win Heater 1A Failed - Cupola	A	CUP	HTR	M1DS48MDX306U	113							
TCS	Cupola Win Heater 2A Failed - Cupola	A	CUP	HTR	M1DS48MDX307U	114							
TCS	Cupola Win Heater 3A Failed - Cupola	A	CUP	HTR	M1DS48MDX308U	115							
TCS	Cupola Win Heater 4A Failed - Cupola	A	CUP	HTR	M1DS48MDX309U	116							
TCS	Cupola Win Heater 5A Failed - Cupola	A	CUP	HTR	M1DS48MDX310U	117							
TCS	Cupola Win Heater 6A Failed - Cupola	A	CUP	HTR	M1DS48MDX311U	118							
TCS	Node 1 Heater 1B Failed - Node 1	A	NOD1	HTR	M1DS48MDX312U	120							
TCS	Node 1 Heater 2B Failed - Node 1	A	NOD1	HTR	M1DS48MDX313U	121							
TCS	Node 1 Heater 3B Failed - Node 1	A	NOD1	HTR	M1DS48MDX314U	122							
TCS	Node 1 Heater 4B Failed - Node 1	A	NOD1	HTR	M1DS48MDX315U	123							
TCS	Node 1 Heater 5B Failed - Node 1	A	NOD1	HTR	M1DS48MDX400U	124							
TCS	Node 1 Heater 6B Failed - Node 1	A	NOD1	HTR	M1DS48MDX401U	125							
TCS	Node 1 Heater 7B Failed - Node 1	A	NOD1	HTR	M1DS48MDX402U	126							
TCS	Node 1 Heater 8B Failed - Node 1	A	NOD1	HTR	M1DS48MDX403U	127							
TCS	Node 1 Heater 9B Failed - Node 1	A	NOD1	HTR	M1DS48MDX404U	128							
TCS	PMA1 Heater 1B Failed - PMA1	A	PMA1	HTR	M1DS48MDX405U	129							
TCS	PMA1 Heater 2B Failed - PMA1	A	PMA1	HTR	M1DS48MDX406U	130							
TCS	PMA1 Heater 3B Failed - PMA1	A	PMA1	HTR	M1DS48MDX407U	131							
TCS	PMA1 Heater 5B Failed - PMA1	A	PMA1	HTR	M1DS48MDX409U	133							
TCS	PMA3 Heater 1A Failed - PMA3	A	PMA3	HTR	M1DS48MDX500U	136							
TCS	PMA3 Heater 2A Failed - PMA3	A	PMA3	HTR	M1DS48MDX501U	137							
TCS	PMA3 Heater 3A Failed - PMA3	A	PMA3	HTR	M1DS48MDX502U	138							
TCS	PMA3 Heater 4A Failed - PMA3	A	PMA3	HTR	M1DS48MDX503U	139							
TCS	PMA3 Heater 5A Failed - PMA3	A	PMA3	HTR	M1DS48MDX504U	140							
TCS	PMA3 Heater 1B Failed - PMA3	A	PMA3	HTR	M1DS48MDX505U	141							
TCS	PMA3 Heater 2B Failed - PMA3	A	PMA3	HTR	M1DS48MDX506U	142							
TCS	PMA3 Heater 3B Failed - PMA3	A	PMA3	HTR	M1DS48MDX507U	143							
TCS	PMA3 Heater 4B Failed - PMA3	A	PMA3	HTR	M1DS48MDX508U	144							
TCS	PMA3 Heater 5B Failed - PMA3	A	PMA3	HTR	M1DS48MDX509U	145							

NODE 1 MDM POWER CONFIGURATION



PCVU MDM CONNECTIVITY

(RT addresses in parenthesis.)



Note: Additional RT information for buses UB EPS-N1-14 and UB EPS-N1-23 may be obtained through the Node 1 MDM Connectivity Dwg.

SPEC 201 CBM CONTROL DISPLAY

	1	2	3	4	5
123456789012345678901234567890123456789012345678901					
XXXX/201/XXX	CBM CONTROL		XX X	DDD/HH:MM:SS	
				DDD/HH:MM:SS	
<u>ALL STOP 1</u>		BOLT	CMDST	POS	LOAD
XXXX	COND CMD	1-1	XXXX	XXX.X	XXXXXX.XX
CBM CONF 2	R SAFE 19	2	XXXX	XXX.X	XXXXXX.XX
	XXX	3	XXXX	XXX.X	XXXXXX.XX
M/S	SAFVAL 20	4	XXXX	XXX.X	XXXXXX.XX
3 ZEN X X/X	RESET 18	1-2	XXXX	XXX.X	XXXXXX.XX
4 NAD X X/X	MSTR STAT	2	XXXX	XXX.X	XXXXXX.XX
5 FWD X X/X	XXXX	3	XXXX	XXX.X	XXXXXX.XX
6 STB X X/X	21 MASK	XX 4	XXXX	XXX.X	XXXXXX.XX
7 PORT X X/X	12345	1-3	XXXX	XXX.X	XXXXXX.XX
	1XXXXXX	2	XXXX	XXX.X	XXXXXX.XX
BOLTCK 8	2XXXXXX	3	XXXX	XXX.X	XXXXXX.XX
ABOLT 1ST 9	3XXXXXX	4	XXXX	XXX.X	XXXXXX.XX
2ND 10	4XXXXXX	1-4	XXXX	XXX.X	XXXXXX.XX
3RD 11	RTL	2	XXXX	XXX.X	XXXXXX.XX
4TH 12	1 XX SS	3	XXXX	XXX.X	XXXXXX.XX
IBOLT 13	2 XX SS	4	XXXX	XXX.X	XXXXXX.XX
FBOLT 14	3 XX SS	LAT	CMDST	ANG	CAPSW
	4 XX SS	1	XXXX	XXX	XX SS
LAT DEPLOY 15	CLOSE	22	2	XXX	XX SS
			3	XXX	XX SS
CAPTURE-1 16			4	XXX	XX SS
CAPTURE-2 17					

PARAMETER CHARACTERISTICS: SM 201 CBM CONTROL DISPLAY

CRT NAME	MSID	UNITS	DISPLAY RANGE	STATUS INDICATORS					FDA (Limits)	
				H	L	M	↑	↓	HI	LO
'CONFIRMATION REQUEST' [1]	P79X0627E, P79X0628E, P79X0629E, P79X0630E, P79X0631E	-----	NONE, RSAF, UBLT, STOP, BIT, CAPT, BBLT, DBLT, ABLTL, MASK, RSET, DPLY, CLOS, FBLT, IBLT, LBLT, RBLT, INIT						----	----
ZEN M (MONITOR FIELD)	P79X0606E, P79X0607E	-----	D = DEACTIVATED A = ACTIVATED M = MONITOR						----	----
ZEN S	P82K5959J, P82K5960J	-----	0 = NO CONTROLLER SELECTED, 1 = PRIME (MASTER) CNTLR 2 = SECONDARY CONTROLLER						----	----
NAD M (MONITOR FIELD)	P79X0608E, P79X0609E	-----	D = DEACTIVATED A = ACTIVATED M = MONITOR						----	----
NAD S	P82K5961J, P82K5962J	-----	0 = NO CONTROLLER SELECTED, 1 = PRIME (MASTER) CNTLR 2 = SECONDARY CONTROLLER						----	----
FWD M (MONITOR FIELD)	P79X0610E, P79X0611E	-----	D = DEACTIVATED A = ACTIVATED M = MONITOR						----	----

PARAMETER CHARACTERISTICS: SM 201 CBM CONTROL DISPLAY (Cont)

CRT NAME	MSID	UNITS	DISPLAY RANGE	STATUS INDICATORS					FDA (Limits)	
				H	L	M	↑	↓	HI	LO
FWD S	P82K5967J, P82K5968J	-----	0 = NO CONTROLLER SELECTED, 1 = PRIME (MASTER) CNTLR 2 = SECONDARY CONTROLLER						----	----
STB M (MONITOR FIELD)	P79X0612E, P79X0613E	-----	D = DEACTIVATED A = ACTIVATED M = MONITOR						----	----
STB S	P82K5963J, P82K5964J	-----	0 = NO CONTROLLER SELECTED, 1 = PRIME (MASTER) CNTLR 2 = SECONDARY CONTROLLER						----	----
PORT M (MONITOR FIELD)	P79X0614E, P79X0615E	-----	D = DEACTIVATED A = ACTIVATED M = MONITOR						----	----
PORT S	P82K5965J, P82K5966J	-----	0 = NO CONTROLLER SELECTED, 1 = PRIME (MASTER) CNTLR 2 = SECONDARY CONTROLLER						----	----
MSTR STAT	P79X0091E, P79X0524E, P79X0525E, P79X0526E	-----	CPLT, PROG, PEND, ABRT, FAIL, TIME						----	----
RTL 1	P79X0163E, P79X0164E	-----	O = OPENED C = CLOSED					↓	----	----

PARAMETER CHARACTERISTICS: SM 201 CBM CONTROL DISPLAY (Cont)

CRT NAME	MSID	UNITS	DISPLAY RANGE	STATUS INDICATORS					FDA (Limits)	
				H	L	M	↑	↓	HI	LO
RTL 2	P79X0172E, P79X0173E	-----	O = OPENED C = CLOSED					↓	----	----
RTL 3	P79X0181E, P79X0182E	-----	O = OPENED C = CLOSED					↓	----	----
RTL 4	P79X0190E, P79X0191E	-----	O = OPENED C = CLOSED					↓	----	----
CMD STAT 1-1	[2]	P79X0059E	CPLT, PROG, FAIL, BIND, INTF, STRP, NOEN, NOAD, MALF, MISS, JAMD, MSBD, ABRT						----	----
BOLT CMD STAT 2-1	P79X0061E								----	----
BOLT CMD STAT 3-1	P79X0071E								----	----
BOLT CMD STAT 4-1	P79X0075E								----	----
BOLT CMD STAT 1-2	P79X0063E								----	----
BOLT CMD STAT 2-2	P79X0067E								----	----
BOLT CMD STAT 3-2	P79X0073E								----	----
BOLT CMD STAT 4-2	P79X0077E								----	----
BOLT CMD STAT 1-3	P79X0065E								----	----
BOLT CMD STAT 2-3	P79X0069E								----	----
BOLT CMD STAT 3-3	P79X0083E								----	----
BOLT CMD STAT 4-3	P79X0087E								----	----
BOLT CMD STAT 1-4	P79X0079E								----	----
BOLT CMD STAT 2-4	P79X0081E								----	----
BOLT CMD STAT 3-4	P79X0085E								----	----
BOLT CMD STAT 4-4	P79X0089E								----	----
POSITION BOLT 1-1	79X0034A	Revs.	0 --- 51						TBD	TBD

PARAMETER CHARACTERISTICS: SM 201 CBM CONTROL DISPLAY (Cont)

CRT NAME	MSID	UNITS	DISPLAY RANGE	STATUS INDICATORS					FDA (Limits)	
				H	L	M	↑	↓	HI	LO
POSITION BOLT 1-2	P79X0036A	Revs.	0 --- 51						TBD	TBD
POSITION BOLT 1-3	P79X0037A	Revs.	0 --- 51						TBD	TBD
POSITION BOLT 1-4	P79X0044A	Revs.	0 --- 51						TBD	TBD
POSITION BOLT 2-1	P79X0035A	Revs.	0 --- 51						TBD	TBD
POSITION BOLT 2-2	P79X0038A	Revs.	0 --- 51						TBD	TBD
POSITION BOLT 2-3	P79X0039A	Revs.	0 --- 51						TBD	TBD
POSITION BOLT 2-4	P79X0045A	Revs.	0 --- 51						TBD	TBD
POSITION BOLT 3-1	P79X0040A	Revs.	0 --- 51						TBD	TBD
POSITION BOLT 3-2	P79X0041A	Revs.	0 --- 51						TBD	TBD
POSITION BOLT 3-3	P79X0046A	Revs.	0 --- 51						TBD	TBD
POSITION BOLT 3-4	P79X0047A	Revs.	0 --- 51						TBD	TBD
POSITION BOLT 4-1	P79X0042A	Revs.	0 --- 51						TBD	TBD
POSITION BOLT 4-2	P79X0043A	Revs.	0 --- 51						TBD	TBD
POSITION BOLT 4-3	P79X0048A	Revs.	0 --- 51						TBD	TBD
POSITION BOLT 4-4	P79X0049A	Revs.	0 --- 51						TBD	TBD
BOLT LOAD 1-1	P79G0002A	POUNDS	-1 to 25,000						TBD	TBD
BOLT LOAD 1-2	P79G0006A	POUNDS	-1 to 25,000						TBD	TBD
BOLT LOAD 1-3	P79G0008A	POUNDS	-1 to 25,000						TBD	TBD
BOLT LOAD 1-4	P79G0022A	POUNDS	-1 to 25,000						TBD	TBD
BOLT LOAD 2-1	P79G0004A	POUNDS	-1 to 25,000						TBD	TBD
BOLT LOAD 2-2	P79G0010A	POUNDS	-1 to 25,000						TBD	TBD
BOLT LOAD 2-3	P79G0012A	POUNDS	-1 to 25,000						TBD	TBD
BOLT LOAD 2-4	P79G0024A	POUNDS	-1 to 25,000						TBD	TBD
BOLT LOAD 3-1	P79G0014A	POUNDS	-1 to 25,000						TBD	TBD

PARAMETER CHARACTERISTICS: SM 201 CBM CONTROL DISPLAY (Cont)

CRT NAME	MSID	UNITS	DISPLAY RANGE	STATUS INDICATORS					FDA (Limits)	
				H	L	M	↑	↓	HI	LO
BOLT LOAD 3-2	P79G0016A	POUNDS	-1 to 25,000						TBD	TBD
BOLT LOAD 3-3	P79G0026A	POUNDS	-1 to 25,000						TBD	TBD
BOLT LOAD 3-4	P79G0029A	POUNDS	-1 to 25,000						TBD	TBD
BOLT LOAD 4-1	P79G0042A	POUNDS	-1 to 25,000						TBD	TBD
BOLT LOAD 4-2	P79G0043A	POUNDS	-1 to 25,000						TBD	TBD
BOLT LOAD 4-3	P79G0048A	POUNDS	-1 to 25,000						TBD	TBD
BOLT LOAD 4-4	P79G0049A	POUNDS	-1 to 25,000						TBD	TBD
LAT CMD STAT 1	P79X0093E	-----	CPLT, PROG, FAIL, BIND, INTF, STRP, NOEN, NOAD, MALF, MISS, JAMD, MSBD, ABRT						-----	-----
LAT CMD STAT 2	P79X0097E								-----	-----
LAT CMD STAT 3	P79X0101E								-----	-----
LAT CMD STAT 4	P79X0105E								-----	-----
LATCH SHAFT POSITION 1 (ANG)	P79H0051A	Revs.	0 --- 51						TBD	TBD
LATCH SHAFT POSITION 2 (ANG)	P79H0053A	Revs.	0 --- 51						TBD	TBD
LATCH SHAFT POSITION 3 (ANG)	P79H0055A	Revs.	0 --- 51						TBD	TBD
LATCH SHAFT POSITION 4 (ANG)	P79H0057A	Revs.	0 --- 51						TBD	TBD
CAP SW -1 (left)	P79X0165E	EVENT	1 = O (OPEN)/ 0 = Blank					↓	-----	-----
-1 (right)	P79X0166E	EVENT	1 = C (CLOSED)/ 0 = Blank					↓	-----	-----
-2 (left)	P79X0174E	EVENT	1 = O (OPEN)/ 0 = Blank					↓	-----	-----
-2 (right)	P79X0175E	EVENT	1 = C (CLOSED)/ 0 = Blank					↓	-----	-----

PARAMETER CHARACTERISTICS: SM 201 CBM CONTROL DISPLAY (Cont)

CRT NAME	MSID	UNITS	DISPLAY RANGE	STATUS INDICATORS					FDA (Limits)	
				H	L	M	↑	↓	HI	LO
CAP SW -3 (left)	P79X0183E	EVENT	1 = O (OPEN)/ 0 = Blank					↓	-----	-----
-3 (right)	P79X0184E	EVENT	1 = C (CLOSED)/ 0 = Blank					↓	-----	-----
-4 (left)	P79X0192E	EVENT	1 = O (OPEN)/ 0 = Blank					↓	-----	-----
-4 (right)	P79X0193E	EVENT	1 = C (CLOSED)/ 0 = Blank					↓	-----	-----

REMARKS

- [1] The four-character field below displays 'CONF'. It is the 'confirmation request' field where the commanded process in work is displayed upon execution of an 'ITEM 2 EXEC'.
- [2] Bolt Command Status, Position, and Loads are to the right of each bolt. For the Command Status, each controller has a particular four-character field to denote if the command is: in progress, failed, if binding is detected, if interference is detected, if missed capture is detected, if stripping is detected, if there is a no engaged condition, if there is a not adjusted condition, if a malfunction is detected, if missing capture is detected, if a jam is detected, if a command missed a broadcast, and if a command was aborted. The user is cued from this field in the event a command has to be masked or if ground intervention is required.

Bolt position is identified to the right of the Command Stat field, and shows the progress of bolt rotation for each once commands are issued. The user can use this cue to determine if a slowdown or jam can be anticipated. This is a good bolt progress column for the user.

Bolt Load is displayed at the right of the display. With each bolt force command increasing as the sequence progresses, the crew can use this cue to determine if an I_Bolt or F_Bolt command needs to be present.

- [3] For each of the four capture latches at the bottom right, similar columns provide the user with latch insight as with the bolts above. Latch command status is similar to the range of four-character fields for the bolt commands above. Latch angle shows the range of full latch extension to the retracted position.

The Capture Switch, along with the position switch, shows whether a particular latch missed the incoming passive segment. An 'O' or 'C' under the 'CA' of the header 'CAPSW' will indicate when a latch switch is open or closed. Under 'SW' of the header a status field will indicate if an open circuit or switch short is evident with a down arrow displayed.

ITEM ENTRY CHARACTERISTICS: SM 201 CBM CONTROL DISPLAY

Items 1 and 2: Item 1 is an all stop command to be used in the event the crew needs to stop any controller activity that could be considered a problem. This is boxed on top as to allow rapid identification and execution. The four-character field below displays 'CONF.' It is the 'confirmation request' field where the commanded process in work is displayed upon execution of an 'ITEM 2 EXEC'. Addendum AA shows the various text feedbacks. The command is a two-step MDM software process to override the firmware command validation step or to send a command which the firmware considers non-default (nominally sent during the ABOLT command).

Below the CBM Confirm Item 2 are the CBM activation hex entries for powering up the opening desired.

Items 3 --- 7: These will be mission unique and will represent Node 1 for early assembly flights and Node 2 for the later flights. These commands will be given to the "active" side of the CBM desired usually at the node interface. 'ITEM 3+1 EXEC' will select a primary (master) controller. 'ITEM 3+2 EXEC' will select a secondary controller. In each case the index number is displayed in the hex field as a crew cue as to which was selected. This is the beginning of the nominal procedures after the power up steps. Item 3 will select the Zenith CBM items 4, 5, 6, and 7 work similarly if procedures require these to be activated.

The 'M/S' fields adjacent to the index field shows the user whether the CBM is activated, deactivated, or in the Monitor state. An 'A' is displayed if activated, a 'D' is displayed if deactivated, and an 'M' is displayed if in the monitor state. The 'S' field displays a 0, 1, 2, or 3 and shows the user if the CBM selected is using no controller, a prime controller, or a backup controller. These correspond to the activate and deactivate command.

Items 8 --- 12: The 'BOLTCK' command 'ITEM 8 EXEC' drives all 16 bolts out 2 turns and in 3 turns. This is a test of the bolt and motor operation to ensure they work as desired prior to the mating operation. The 'ITEM 9 EXEC' rotates the first group of four bolts (each 90 degrees apart) and they will drive out to acquire the passive corresponding nuts. Items 10, 11, and 12 will do the same respectively. These are the 'Acquire' or 'Abolt' commands.

Item 13: IBOLT - command continues the bolting process but takes all bolts to a higher load (automatically sequenced four at a time). Nominally, these commands will be sent several times in a row to ensure proper bolt loads are delivered.

Item 14: FBOLT - command continues the bolt torque until the bolts are taken to their final load. This command is sent several times to ensure the bolts reach their final load.

Item 15: LAT DEPLOY - command sends out the latches (4) from the retracted position in preparation to grapple the passive portion of the CBM of the component to be berthed.

Item 16: CAPTURE-1 - command moves all four capture latches in the first step of a two-step sequence, moving the latches to the 150° position.

- Item 17: CAPTURE-2 - command moves all four capture latches in the first step of a two-step sequence, moving the latches to the 150° position.
- Item 18: RESET - a reset command similar to that on a home computer. It allows a restart if the software sequences lock up.
- Item 19: R SAFE - the Contingency Command 'ITEM 19 EXEC' which starts a sequence of three commands to start the process of CBM support of the 20 minute separation requirement for a fast getaway of the Orbiter should that become necessary. Note: the second command in this sequence is the CBM_Confirmation_Command. Upon successful completion of this event, a 'VAL' appears below item 19 prompting the operator to be sure they really want to initiate Rapid Safing.
- Item 20: SAFVAL - 'ITEM 20 EXEC' is the third of three commands that are required to start the process of mating the CBM automatically to support the Shuttle 20 minute sep requirement (the second command is the CBM_Confirmation_Command).
- Items 21: Above item 21 is the field for the Master Stat Code. This four-character telemetry field tells the user the status of the Master Controller assigned (ie: whether a command is in complete, in progress, pending, aborted, failed, or has timed out.) The addendum Q defines the bit combinations that generate the text fields.
- MASK - 'ITEM 21 + XX', the Mask Bolt commands, are indexed item entries. The XX are integers that are: 11, 12, 13, 14, 15, 21, 22, 23, 24, 25, 31, 32, 33, 34, 35, 41, 42, 43, 44, and 45, each correspond to the bolt groups. All other hex entries will result in an 'ILLEGAL ENTRY' message. These commands are defined in addendum 'F' of the keyboard processing table.
- These are grouped in a matrix to mask a single or multiple controller failure should that malfunction happen. This is a contingency area on the display which, when a certain actuator is masked, an asterisk is driven at the appropriate X,Y coordinate of the controller/actuator being masked. For example, if an 'ITEM 21+ 22 EXEC' is entered, an asterisk is driven adjacent the vertical column at 2 and under the horizontal column at 2. This command deselects the actuator/controller 2-2. There is a group 5 listed there and these are the latch controller/actuators that can be masked similarly as with the bolts.
- The Ready To Latch (RTL) area below is a discrete feedback field on the display to provide the RMS operator with a series of alpha characters 'O' for an Open or 'C' for a Closed indication for each of four latches. The characters indicate whether the CBM is in the capture envelope for the latch that corresponds to that specific RTL. Adjacent to each latch is a pair of stand alone status that (left to right) provide insight to a switch short or an open circuit respectively, in either case if a down arrow is displayed if the event has occurred.
- Item 22: CLOSE - the command that mates the active with the passive CBM segment in preparation for the bolt driving process.

SPEC 202 CBM POWER DISPLAY

	1	2	3	4	5
1	123456789012345678901234567890123456789012345678901	CBM POWER	XX X	DDD/HH/MM/SS	
2				DDD/HH/MM/SS	
3					
4	PRI ON/OFF	SEC ON/OFF	PRI ON/OFF	SEC ON/OFF	
5	TRIP	TRIP	TRIP	TRIP	
6	FORWARD			AFT	
7	1 1X 2X S	25X 26X S			
8	2 3X 4X S	27X 28X S			
9	3 5X 6X S	29X 30X S			
10	4 7X 8X S	31X 32X S			
11					
12		PORT		STARBOARD	
13	1 9X 10X S	33X 34X S	1 49X 50X S	65X 66X	S
14	2 11X 12X S	35X 36X S	2 51X 52X S	67X 68X	S
15	3 13X 14X S	37X 38X S	3 53X 54X S	69X 70X	S
16	4 15X 16X S	39X 40X S	4 55X 56X S	71X 72X	S
17					
18		ZENITH		NADIR	
19	1 17X 18X S	41X 42X S	1 57X 58X S	73X 74X	S
20	2 19X 20X S	43X 44X S	2 59X 60X S	75X 76X	S
21	3 21X 22X S	45X 46X S	3 61X 62X S	77X 78X	S
22	4 23X 24X S	47X 48X S	4 63X 64X S	79X 80X	S
23					
24					

PARAMETER CHARACTERISTICS: SM 202 CBM POWER DISPLAY

CRT NAME	MSID	DISPLAY RANGE	STATUS INDICATORS				
			H	L	M	↑	↓
FORWARD PRI 1 TRIP	P79X0427E	1 = YES, 0 = NO					↓
FORWARD PRI 2 TRIP	P79X0428E	1 = YES, 0 = NO					↓
FORWARD PRI 3 TRIP	P79X0429E	1 = YES, 0 = NO					↓
FORWARD PRI 4 TRIP	P79X0430E	1 = YES, 0 = NO					↓
PORT PRI 1 TRIP	P79X0468E	1 = YES, 0 = NO					↓
PORT PRI 2 TRIP	P79X0469E	1 = YES, 0 = NO					↓
PORT PRI 3 TRIP	P79X0471E	1 = YES, 0 = NO					↓
PORT PRI 4 TRIP	P79X0472E	1 = YES, 0 = NO					↓
ZENITH PRI 1 TRIP	P79X0422E	1 = YES, 0 = NO					↓
ZENITH PRI 2 TRIP	P79X0423E	1 = YES, 0 = NO					↓
ZENITH PRI 3 TRIP	P79X0424E	1 = YES, 0 = NO					↓
ZENITH PRI 4 TRIP	P79X0425E	1 = YES, 0 = NO					↓
FORWARD SEC 1 TRIP	P79X0432E	1 = YES, 0 = NO					↓
FORWARD SEC 2 TRIP	P79X0433E	1 = YES, 0 = NO					↓
FORWARD SEC 3 TRIP	P79X0434E	1 = YES, 0 = NO					↓
FORWARD SEC 4 TRIP	P79X0432E	1 = YES, 0 = NO					↓
PORT SEC 1 TRIP	P79X0456E	1 = YES, 0 = NO					↓
PORT SEC 2 TRIP	P79X0457E	1 = YES, 0 = NO					↓
PORT SEC 3 TRIP	P79X0459E	1 = YES, 0 = NO					↓
PORT SEC 4 TRIP	P79X0460E	1 = YES, 0 = NO					↓
ZENITH SEC 1 TRIP	P79X0438E	1 = YES, 0 = NO					↓
ZENITH SEC 2 TRIP	P79X0439E	1 = YES, 0 = NO					↓
ZENITH SEC 3 TRIP	P79X0440E	1 = YES, 0 = NO					↓
ZENITH SEC 4 TRIP	P79X0441E	1 = YES, 0 = NO					↓
STARBOARD PRI 1 TRIP	P79X0462E	1 = YES, 0 = NO					↓
STARBOARD PRI 2 TRIP	P79X0463E	1 = YES, 0 = NO					↓
STARBOARD PRI 3 TRIP	P79X0465E	1 = YES, 0 = NO					↓
STARBOARD PRI 4 TRIP	P79X0466E	1 = YES, 0 = NO					↓

PARAMETER CHARACTERISTICS: SM 202 CBM POWER DISPLAY (Cont)

CRT NAME	MSID	DISPLAY RANGE	STATUS INDICATORS				
			H	L	M	↑	↓
NADIR PRI 1 TRIP	P79X0520E	1 = YES, 0 = NO					↓
NADIR PRI 2 TRIP	P79X0521E	1 = YES, 0 = NO					↓
NADIR PRI 3 TRIP	P79X0522E	1 = YES, 0 = NO					↓
NADIR PRI 4 TRIP	P79X0523E	1 = YES, 0 = NO					↓
STARBOARD SEC 1 TRIP	P79X0474E	1 = YES, 0 = NO					↓
STARBOARD SEC 2 TRIP	P79X0475E	1 = YES, 0 = NO					↓
STARBOARD SEC 3 TRIP	P79X0477E	1 = YES, 0 = NO					↓
STARBOARD SEC 4 TRIP	P79X0478E	1 = YES, 0 = NO					↓
NADIR SEC 1 TRIP	P79X0443E	1 = YES, 0 = NO					↓
NADIR SEC 2 TRIP	P79X0444E	1 = YES, 0 = NO					↓
NADIR SEC 3 TRIP	P79X0445E	1 = YES, 0 = NO					↓
NADIR SEC 4 TRIP	P79X0446E	1 = YES, 0 = NO					↓

ITEM ENTRY CHARACTERISTICS: SM 202 CBM POWER DISPLAY

Items 1 and 2: FORWARD PRI RPC 3 ON (OFF) - applies power to and powers off the Forward Primary circuit 1. Items 1 and 2 are power up and power down commands of the RPC 3 circuit. Those bolts and latches would lose power if the circuit were tripped (see the CBM Control display for the specific bolts and latch). Upon completion of each command, an asterisk is driven adjacent to the item number. The corresponding trip field will indicate a tripped circuit and will cause an asterisk and a down arrow to be driven in the parameter status column if the appropriate discrete is set high. Accompanying the tripped indication, a fault message is driven on the message line indicating the source of the tripped circuit.

The power primary and secondary parameter fields are in partitioned groups of four. There are groups of bolts and latches that are powered by each group under the header of primary and secondary. Each of the groups have a dedicated RPC for that group. (A check of the specific components powered by the RPC's and RPCMs is found in the Electrical Power Architecture Workbook).

Items 25 and 26: The Secondary circuit fields are displayed similarly to the Primary circuits.

Items 3 and 4: FORWARD PRI RPC 4 ON (OFF) - similarly power the bolts and latch tied to the RPC 4 circuit.

Items 27 and 28: The Secondary circuit fields are displayed similarly to the Primary circuits.

Items 5 and 6: FORWARD PRI RPC 5 ON (OFF) - similarly be powered by RPC 5.

Items 29 and 30: The Secondary circuit fields are displayed similarly to the Primary circuits.

Items 7 and 8: FORWARD PRI RPC 6 ON (OFF) - similarly be powered by RPC 6.

Items 31 and 32: The Secondary circuit fields are displayed similarly to the Primary circuits.

Items 9 and 10: PORT PRI RPC 3 ON (OFF) - applies power to and powers off the Port Primary circuit 1. Items 9 and 10 are power up and power down commands of the RPC 3 circuit. Those bolts and latches would lose power if the circuit were tripped (see the CBM Control display for the specific bolts and latch). Upon completion of each command, an asterisk is driven adjacent to the item number. The corresponding trip field will indicate a tripped circuit and will cause an asterisk and a down arrow to be driven in the parameter status column if the appropriate discrete is set high. Accompanying the tripped indication, a fault message is driven on the message line indicating the source of the tripped circuit.

The power primary and secondary parameter fields are in partitioned groups of four. There are groups of bolts and latches that are powered by each group under the header of primary and secondary. Each of the groups have a dedicated RPC for that group. (A check of the specific components powered by the RPCs and RPCMs is found in the Electrical Power Architecture Workbook).

- Items 33 and 34: The Secondary circuit fields are displayed similarly to the Primary circuits.
- Items 11 and 12: PORT PRI RPC 4 ON (OFF) - similarly be powered by RPC 4.
- Items 35 and 36: The Secondary circuit fields are displayed similarly to the Primary circuits.
- Items 13 and 14: PORT PRI RPC 5 ON (OFF) - similarly be powered by RPC 5.
- Items 37 and 38: The Secondary circuit fields are displayed similarly to the Primary circuits.
- Items 15 and 16: FORWARD PRI RPC 6 ON (OFF) - similarly be powered by RPC 6.
- Items 39 and 40: The Secondary circuit fields are displayed similarly to the Primary circuits.
- Items 17 and 18: ZENITH PRI RPC 3 ON (OFF) - applies power to and powers off the Zenith Primary circuit 1. Items 17 and 18 are power up and power down commands of the RPC 3 circuit. Those bolts and latches would lose power if the circuit were tripped (see the CBM Control display for the specific bolts and latch). Upon completion of each command, an asterisk is driven adjacent to the item number. The corresponding trip field will indicate a tripped circuit and will cause an asterisk and a down arrow to be driven in the parameter status column if the appropriate discrete is set high. Accompanying the tripped indication, a fault message is driven on the message line indicating the source of the tripped circuit.

The power primary and secondary parameter fields are in partitioned groups of four. There are groups of bolts and latches that are powered by each group under the header of primary and secondary. Each of the groups have a dedicated RPC for that group. (A check of the specific components powered by the RPCs and RPCMs is found in the Electrical Power Architecture Workbook).

- Items 41 and 42: The Secondary circuit fields are displayed similarly to the Primary circuits.
- Items 19 and 20: ZENITH PRI RPC 4 ON (OFF) - similarly power the bolts and latch tied to the RPC 4 circuit.
- Items 43 and 44: The Secondary circuit fields are displayed similarly to the Primary circuits.
- Items 21 and 22: ZENITH PRI RPC 5 ON (OFF) - similarly be powered by RPC 5.
- Items 45 and 46: The Secondary circuit fields are displayed similarly to the Primary circuits.
- Items 23 and 24: ZENITH PRI RPC 6 ON (OFF) - similarly be powered by RPC 6.
- Items 47 and 48: The Secondary circuit fields are displayed similarly to the Primary circuits.

Items 49 and 50: STARBOARD PRI RPC 3 ON (OFF) - applies power to and powers off the Starboard Primary circuit 1. Items 49 and 50 are power up and power down commands of the RPC 3 circuit. Those bolts and latches would lose power if the circuit were tripped (see the CBM Control display for the specific bolts and latch). Upon completion of each command, an asterisk is driven adjacent to the item number. The corresponding trip field will indicate a tripped circuit and will cause an asterisk and a down arrow to be driven in the parameter status column if the appropriate discrete is set high. Accompanying the tripped indication, a fault message is driven on the message line indicating the source of the tripped circuit.

The power primary and secondary parameter fields are partitioned in groups of four. There are groups of bolts and latches that are powered by each group under the header of primary and secondary. Each of the groups have a dedicated RPC for that group. (A check of the specific components powered by the RPCs and RPCMs is found in the Electrical Power Architecture Workbook).

- Items 65 and 66: The Secondary circuit fields are displayed similarly to the Primary circuits.
- Items 51 and 52: STARBOARD PRI RPC 4 ON (OFF) - similarly power the bolts and latch tied to the RPC 4 circuit.
- Items 67 and 68: The Secondary circuit fields are displayed similarly to the Primary circuits.
- Items 53 and 54: STARBOARD PRI RPC 5 ON (OFF) - similarly be powered by RPC 5.
- Items 69 and 70: The Secondary circuit fields are displayed similarly to the Primary circuits.
- Items 55 and 56: STARBOARD PRI RPC 6 ON (OFF) - similarly be powered by RPC 6.
- Items 71 and 72: The Secondary circuit fields are displayed similarly to the Primary circuits.
- Items 57 and 58: NADIR PRI RPC 3 ON (OFF) - applies power to and powers off the Nadir Primary circuit 1. Items 57 and 58 are power up and power down commands of the RPC 3 circuit. Those bolts and latches would lose power if the circuit were tripped (see the CBM Control display for the specific bolts and latch). Upon completion of each command, an asterisk is driven adjacent to the item number. The corresponding trip field will indicate a tripped circuit and will cause an asterisk and a down arrow to be driven in the parameter status column if the appropriate discrete is set high. Accompanying the tripped indication, a fault message is driven on the message line indicating the source of the tripped circuit.

The power primary and secondary parameter fields are partitioned in groups of four. There are groups of bolts and latches that are powered by each group under the header of primary and secondary. Each of the groups have a dedicated RPC for that group. (A check of the specific components powered by the RPCs and RPCMs is found in the Electrical Power Architecture Workbook).

- Items 73 and 74: The Secondary circuit fields are displayed similarly to the Primary circuits.

- Items 59 and 60: NADIR PRI RPC 4 ON (OFF) - similarly power the bolts and latch tied to the RPC 4 circuit.
- Items 75 and 76: The Secondary circuit fields are displayed similarly to the Primary circuits.
- Items 61 and 62: NADIR PRI RPC 5 ON (OFF) - similarly be powered by RPC 5.
- Items 77 and 78: The Secondary circuit fields are displayed similarly to the Primary circuits.
- Items 63 and 64: NADIR PRI RPC 6 ON (OFF) - similarly be powered by RPC 6.
- Items 79 and 80: The Secondary circuit fields are displayed similarly to the Primary circuits.

SPEC 203 EARLY COMM DISPLAY

123456789012345678901234567890123456789012345678901

1	XXXX/203/XXX	EARLY COMM	XX X	DDD/HH/MM/SS
2				DDD/HH/MM/SS
3				
4	N1RS1C RPC	CL 5 6 12 13	OP 1X 3X 5X 7X	PTG MODE MANUAL AUTO
5				22X 23X
6	N1RS2A RPC	5 6 10 11	9X 11X 13X 15X	ANT SEL PORT OMNI STBD OMNI
7				24X 25X
8				
9				
10				
11				
12				
13	XMIT	ON	OFF	26 PORT ARRAY BEAM
14	DECRYPT	17X	18X	27 STBD ARRAY BEAM
15		X	19X	BEAM SEL XX
16	KEY	XXX		
17	POST	XXXX		
18	CPT POST	XXXX		SIG STR XXX
19				
20	SYS MODE	HI	LO	
21	FRM LOCK	20X	21X	TEMP I/F
22	PORTCOM	XXX		PORT ANT XXX
23	CTP	XXX		STBD ANT XXX
24	R-S RJCT	XXX		PORTCOM XXX
25				CTP XXX
26				

PARAMETER CHARACTERISTICS: SM 203 EARLY COMM DISPLAY

CRT NAME	MSID	UNITS	DISPLAY RANGE
DECRYPT ON	P79X0592E	-----	'*' = 1, blank = 0
DECRYPT KEY BIT 0/4/8	P79U0594D/ P79U0327D/ P79U0330D	-----	TBD
DECRYPT POST	P79X0595E	-----	FAIL = 1, PASS = 0
CPT POST	P79X0372E	-----	FAIL = 0, PASS = 1
FRM LOCK PORTCOM	P79X0591E	-----	YES = 1, NO = 0
FRM LOCK CTP	P79X0605E	-----	NO = 1, YES = 0
R-S RJCT [1]	P79X0590E	-----	YES = 1, NO = 0
BEAM SEL	P79U0599D	-----	TBD
SIG STR	P79U0600A	CNT	0 --- 255
PORT ANT TEMP	P79U0601A	CNT	0 --- 255
STBD ANT TEMP	P79U0602A	CNT	0 --- 255
PORTCOM TEMP	P79U0603A	CNT	0 --- 255
CTP TEMP	P79U0604A	CNT	0 --- 255
PORT ANT I/F	P79X0373E	-----	ERR = 1, OK = 0
STBD ANT I/F	P79X0374E	-----	ERR = 1, OK = 0
PORTCOM I/F	P79X0375E	-----	ERR = 1, OK = 0

REMARKS

- [1] This parameter displays 'YES' or 'NO' to indicate if forward link packets are being discarded due to Reed-Solomon rejects.

ITEM ENTRY CHARACTERISTICS: SM 203 EARLY COMM DISPLAY

- Items 1 --- 16: N1RS1C RPC (5,6,12,13) and N1RS2A RPC (5,6,10,11) - powers on (CL) and powers off (OP) the Remote Power Controllers (RPCs) associated with the Early Communication System. An asterisk will be displayed next to the appropriate item number to indicate the open/closed status of each RPC.
- Items 17 and 18: XMIT - powers ON and OFF the Early Communication System transmitter, respectively. An asterisk will be displayed next to the appropriate item number to indicate transmitter status.
- Item 19: DECRYPT - turns OFF the Decryption function. An asterisk will be displayed next to item 19 to indicate that the decryption function is OFF; otherwise, an asterisk will be displayed under the ON column. The KEY field displays the index number of the decryption key currently in use. This value is displayed in hex. The POST field displays either 'PASS' or 'FAIL' to indicate whether or not the decryption Power On Self-Test (POST) was successful.

The Command/Telemetry Processor (CTP) POST field displays either 'PASS' or 'FAIL' to indicate whether or not the CTP POST was successful.
- Items 20 and 21: SYS MODE - selects either the HI or LO system mode, respectively. An asterisk will be displayed next to the appropriate item entry to indicate the current system mode. HI mode is used for video-teleconferencing and LO mode is used for command/telemetry transmission.
- Items 22 and 23: PTG MODE - allow the crew to select either the MANUAL or AUTO pointing modes, respectively. An asterisk will be displayed next to the appropriate item entry to indicate the current mode. Normal operation of the system will be in automatic pointing mode.
- Items 24 and 25: ANT SEL - selects either the PORT or STBD OMNI antenna respectively. These commands are used when in Low Data Rate and Manual Pointing Mode only. An asterisk will be displayed next to the appropriate item entry to indicate the antenna selected regardless of pointing mode.
- Items 26 and 27: PORT or STBD ARRAY BEAM - selects either the PORT or STBD ARRAY BEAM. These commands are used in conjunction with the Automatic Pointing Mode to give the antenna pointing algorithm an initial beam reference for signal acquisition. These commands are also used for full manual control of the arrays when in Manual Pointing Mode. These are indexed commands with 64 beam selection. An asterisk is displayed to the right of the command feedback field to indicate PORT or STBD is in use.

SPEC 204 FGB DISPLAY

1 123456789012345678901234567890123456789012345678901
 2 123456789012345678901234567890123456789012345678901
 3 123456789012345678901234567890123456789012345678901
 4 123456789012345678901234567890123456789012345678901
 5 123456789012345678901234567890123456789012345678901

1	XXXX/204/XXX	FGB	XX X	DDD/HH/MM/SS
2				DDD/HH/MM/SS
3				
4				
5	MAIN BUS	VOLTS	AMPS	
6	V1	XXX.X	XXXX.X	
7	V2	XXX.X		
8	SOLAR ARRAY		XXX.X	BC SYNC FRM CTR
9				XXXS
10	RACU 5	INP	XXX.X	COMMANDING
11		OUT	XXX.XS	CMD DIR
12				MU RDY CH 1
13	RACU 6	INP	XXX.X	2
14		OUT	XXX.XS	3
15				OCS RDY 1
16		ON	OFF	2
17	RACU 5	PWR	X	
18	VIA	FGB	1	5
19	NCS		2	6
20				BATT VOLTS CHG 1 CHG 2
21	RACU 6	PWR	X	3
22	VIA	FGB	3	4
23	NCS		4	5
24				6 XX.X XX.X XX.X XX.X
25				
26				

PARAMETER CHARACTERISTICS: SM 204 FGB DISPLAY

CRT NAME	MSID	UNITS	DISPLAY RANGE	STATUS INDICATORS					FDA (Limits)	
				M	H	L	↑	↓	HI	LO
MAIN BUS AMPS	P79C0236A	AMP	0 --- 600						N/A	N/A
MAIN BUS V1 VOLTS	P79V0270A	VDC	0 --- 40					↓	N/A	28.5
MAIN BUS V2 VOLTS	P79V0272A	VDC	0 --- 40					↓	N/A	28.5
SOLAR ARRAY AMPS	P79C0510A	AMP	0 --- 600						N/A	N/A
RACU 5 INPUT AMPS	P79C0242A	AMP	0 --- 35						N/A	N/A
RACU 5 OUTPUT VOLTS	P79V0274A	VDC	0 – 150				↑	↓	130V	118V
RACU 5 OUTPUT AMPS	P79C0238A	AMP	0 --- 80				↑		16A	N/A
RACU 6 INPUT AMPS	P79C0244A	AMP	0 --- 35						N/A	N/A
RACU 6 OUTPUT VOLTS	P79V0276A	VDC	0 --- 150				↑	↓	130V	118V
RACU 6 OUTPUT AMPS	P79C0240A	AMP	0 --- 80				↑		16A	N/A
RACU 5 POWER ON	P79X0383E	-----	'*' = 1, blank = 0						-----	-----
RACU 5 POWER OFF		-----	blank = 1, '*' = 0						-----	-----
RACU 6 POWER ON	P79X0384E	-----	'*' = 1, blank = 0						-----	-----
RACU 6 POWER OFF		-----	blank = 1, '*' = 0						-----	-----
BC SYNC [1]	P79X0211E	-----	YES = 0, NO = 1					↓	N/A	1
FRM CTR [2]	P79U0116D	-----	INCREMENT						-----	-----
COMMANDING [3]	P79X0511E	-----	ENA = 1, INH = 0						-----	-----
CMD DIRECTION [4]	P79X0512E	-----	MU = 1, DIO = 0						-----	-----
MU READY CH 1	P79X0513E	-----	YES = 1, NO = 0						-----	-----
MU READY CH 2	P79X0514E	-----	YES = 1, NO = 0						-----	-----

PARAMETER CHARACTERISTICS: SM 204 FGB DISPLAY (Cont)

CRT NAME	MSID	UNITS	DISPLAY RANGE	STATUS INDICATORS					FDA (Limits)	
				M	H	L	↑	↓	HI	LO
MU READY CH 3	P79X0515E	-----	YES = 1, NO = 0						-----	-----
OCS READY 1	P79X0518E	-----	YES = 1, NO = 0						-----	-----
OCS READY 2	P79X0519E	-----	YES = 1, NO = 0						-----	-----
BATT 1 VOLTS [5]	P79V0278A	VDC	0 --- 35					↓	N/A	25.5
BATT 1 CHG 1 [5]	P79E0246A	AMP-HRS	0 --- 60						N/A	N/A
BATT 1 CHG 2 [5]	P79E0248A	AMP-HRS	0 --- 60						N/A	N/A
BATT 2 VOLTS [5]	P79V0280A	VDC	0 --- 35					↓	N/A	25.5
BATT 2 CHG 1 [5]	P79E0250A	AMP-HRS	0 --- 60						N/A	N/A
BATT 2 CHG 2 [5]	P79E0252A	AMP-HRS	0 --- 60						N/A	N/A
BATT 3 VOLTS [5]	P79V0282A	VDC	0 --- 35					↓	N/A	25.5
BATT 3 CHG 1 [5]	P79E0254A	AMP-HRS	0 --- 60						N/A	N/A
BATT 3 CHG 2 [5]	P79E0256A	AMP-HRS	0 --- 60						N/A	N/A
BATT 4 VOLTS [5]	P79V0284A	VDC	0 --- 35					↓	N/A	25.5
BATT 4 CHG 1 [5]	P79E0258A	AMP-HRS	0 --- 60						N/A	N/A
BATT 4 CHG 2 [5]	P79E0260A	AMP-HRS	0 --- 60						N/A	N/A
BATT 5 VOLTS [5]	P79V0286A	VDC	0 --- 35					↓	N/A	25.5
BATT 5 CHG 1 [5]	P79E0262A	AMP-HRS	0 --- 60						N/A	N/A
BATT 5 CHG 2 [5]	P79E0264A	AMP-HRS	0 --- 60						N/A	N/A
BATT 6 VOLTS [5]	P79V0288A	VDC	0 --- 35					↓	N/A	25.5
BATT 6 CHG 1 [5]	P79E0266A	AMP-HRS	0 --- 60						N/A	N/A
BATT 6 CHG 2 [5]	P79E0268A	AMP-HRS	0 --- 60						N/A	N/A

REMARKS

- [1] In the BC SYNC field, either 'YES' or 'NO' will be displayed to indicate whether or not the FGB MDM is communicating with the bus controller (either the OIU or Node MDM). When the FGB MDM loses sync with the bus controller, this field will read 'NO' and the crew will receive an alert light, tone and fault message.
- [2] By checking to see if the frame counter (FRM CTR) is incrementing, the crew can determine whether data is being received from the FGB MDM.
- [3] The COMMANDING field indicates whether or not the relay command matrix has been enabled (ENA) or inhibited (INH). The relay command matrix is controlled by the Mission Control Center in Moscow (**MCC-M**). When this command matrix is enabled, the Mission Control Center in Houston (**MCC-H**) or the crew can command the FGB. This field must read 'ENA' before either **MCC-H** or the crew has the capability to issue the RACU power ON and OFF commands.
- [4] The CDM DIR field indicates the direction of a command sent to a FGB element. This field will read either 'MU' to indicate that the command was originated from the Matching Unit or 'DIO' to indicate that the command was originated from the FGB MDM.
- [5] The BATT section displays the voltage and two charge readings for the six FGB batteries. The BATT CHG parameters measure the state of charge in Amp-hrs of the batteries. The range is 0 to 60 Amp-hrs, 0 being a completely drained battery and 60 being a fully charged battery. There are two sensors that measure the charge. The Russians are able to select and de-select the sensors depending on their telemetry needs. Therefore, both sets of battery charge data may not be available.

ITEM ENTRY CHARACTERISTICS: SM 204 FGB DISPLAY

- Items 1 --- 5: RACU 5 PWR VIA FGB ON/OFF - enables the crew to command RACU 5 power On/Off via the FGB MDM when the OIU is the bus controller. An asterisk will be displayed under the ON/OFF column.
- Items 3 --- 7: RACU 6 PWR VIA FGB ON/OFF - enables the crew to command RACU 6 power On/Off via the FGB MDM when the OIU is the bus controller. An asterisk will be displayed under the ON/OFF column.
- Items 2 --- 6: RACU 5 PWR VIA NCS ON/OFF - enables the crew to command RACU 5 power On/Off via Node MDM when the Node MDM is the bus controller. An asterisk will be displayed under the ON/OFF column.
- Items 4 --- 8: RACU 6 PWR VIA NCS ON/OFF - enables the crew to command RACU 6 power On/Off via Node MDM when the Node MDM is the bus controller. An asterisk will be displayed under the ON/OFF column.

SPEC 210 NODE 1 DISPLAY

1234567890123456789012345678901234567890123456789012345678901

XXXX/210/XXX				NODE 1		XX	X	DDD/HH/MM/SS
						DDD/HH/MM/SS		
	PRI	MDM	SEC	MDM	CABIN PRESS		XX.XXS	
STATE	XXXX		XXXX	XXXX				
STBY		1		2	BUS CONFIG			
N1-1	TO	SEC	3				CH A	CH B
CONFIG	XXX		XXX		N1-1 MDM			
FRM	CTR	XXX		XXX	UB	ORB N1-1	XX	19X
SYNC				XXS	CB	GNC-1	XX	21X
					LB	LAB SYS-1	XX	23X
								24X
TEMP	N1-1	XXXX			N1-2 MDM			
	N1-2	XXXX			UB	ORB N1-2	XX	25X
LOAD	SHED				CB	GNC-2	XX	27X
VIA	NCS	4+	XXX		LB	LAB SYS-2	XX	29X
	FGB		XXS					30X
POWER	ON	OFF	TRIP	PRI	MDM			
N1-1	MDM	7X	8X	S	UB	EPS N1-14	XX	31X
	SDO A	9X	10X	S			N1-23	33X
	B	11X	12X	S				34X
N1-2	MDM	13X	14X	S	ISS	C&W TONE	STATUS	
	SDO A	15X	16X	S	FIRE	S		
	B	17X	18X	S	WARN	S	CAUT	S

PARAMETER CHARACTERISTICS: SM 210 NODE 1 DISPLAY

CRT NAME	MSID	UNITS	DISPLAY RANGE	STATUS INDICATORS					FDA (Limits)	
				H	L	M	↑	↓	HI	LO
PHY ID PRI MDM	[1]	P79X0484E	-----	1 = N1-2, 0 = N1-1					-----	-----
PHY ID SEC MDM	[1]	P79X0486E	-----	1 = N1-2, 0 = N1-1					-----	-----
STATE PRI MDM BIT 5/6/7	[2]	P79X0120E/ P79X0487E/ P79X0488E	-----	STBY = 001 PRI = 010 SEC = 011 DIA = 111					-----	-----
STATE SEC MDM BIT 5/6/7	[2]	P79X0111E/ P79X0489E/ P79X0490E	-----	STBY = 001 PRI = 010 SEC = 011 DIA = 111					-----	-----
LOAD SHED VIA FGB	[6]	P79X0058E, P79X0068E, P79X0072E	-----	NO = 0, YES = 1				↓	N/A	1
CONFIG PRI MDM BIT 3-6	[3]	P79X0118E, P79X0500E → P79X0502E	-----	C01 --- C16					-----	-----
CONFIG SEC MDM BIT 3-6	[3]	P79X0109E, P79X0503E → P79X0505E	-----	C01 --- C16					-----	-----
FRM CTR PRI MDM	[4]	P79U0509D	-----	INCREMENT					-----	-----
FRM CTR SEC MDM	[4]	P79U0114D	-----	INCREMENT					-----	-----
SYNC - SEC MDM	[5]	P79X0112E	-----	1 = NO, 0 = YES				↓	N/A	1
TEMP N1-1		P79T0107D	°F	TBD					TBD	TBD
TEMP N1-2		P79T0106D	°F	TBD					TBD	TBD
N1-1 MDM POWER TRIP		P79X0453E	-----	-----				↓	N/A	1
N1-1 SDO A POWER TRIP		P79X0450E	-----	-----				↓	N/A	1
N1-1 SDO B POWER TRIP		P79X0451E	-----	-----				↓	N/A	1
N1-2 MDM POWER TRIP		P79X0300E	-----	-----				↓	N/A	1

PARAMETER CHARACTERISTICS: SM 210 NODE 1 DISPLAY (Cont)

CRT NAME	MSID	UNITS	DISPLAY RANGE	STATUS INDICATORS					FDA (Limits)	
				H	L	M	↑	↓	HI	LO
N1-2 SDO A POWER TRIP	P79X0298E	-----	-----					↓	N/A	1
N1-2 SDO B POWER TRIP	P79X0299E	-----	-----					↓	N/A	1
CABIN PRESS [7]	P79P0493A	PSIA	TBD				↑	↓	15	13.9
UB ORB N1-1 BUS CONFIG [8]	P79X0128E/ P79X0491E	-----	NA = 00 RT = 01 BC = 10						-----	-----
CB GNC-1 BUS CONFIG BIT 6/7 [8]	P79X0126E/ P79X0492E	-----	NA = 00 RT = 01 BC = 10						-----	-----
LB LAB SYS-1 BUS CONFIG BIT 6/7 [8]	P79X0124E/ P79X0494E	-----	NA = 00 RT = 01 BC = 10						-----	-----
UB ORB N1-2 BUS CONFIG BIT 6/7 [8]	P79X0134E/ P79X0495E	-----	NA = 00 RT = 01 BC = 10						-----	-----
CB GNC-2 BUS CONFIG BIT 6/7 [8]	P79X0132E/ P79X0496E	-----	NA = 00 RT = 01 BC = 10						-----	-----
LB LAB SYS-2 BUS CONFIG BIT 6/7 [8]	P79X0130E/ P79X0497E	-----	NA = 00 RT = 01 BC = 10						-----	-----
UB EPS N1-14 BUS CONFIG BIT 6/7 [8]	P79X0140E/ P79X0498E	-----	NA = 00 RT = 01 BC = 10						-----	-----
UB EPS N1-23 BUS CONFIG BIT 6/7 [8]	P79X0122E/ P79X0499E	-----	NA = 00 RT = 01 BC = 10						-----	-----
FIRE [9]	P79X0161E	-----	-----					↓	N/A	1
WARN [9]	P79X0158E	-----	-----					↓	N/A	1
CAUT [9]	P79X0157E	-----	-----					↓	N/A	1

REMARKS

- [1] The PHY ID field will display 'N1-1' or 'N1-2' to indicate which ISS Node 1 Multiplexer/Demultiplexer (MDM) is the primary (PRI) and secondary (SEC) Node Control Software (NCS) MDM. For nominal operations, N1-2 will be the PRI MDM and N1-1 will be the SEC MDM.
- [2] The STATE field indicates the operational state of the primary and secondary MDMs. This field will read 'PRI' for primary, 'SEC' for secondary, 'STBY' for standby and 'DIA' for diagnostics.
- [3] The CONFIG field indicates the configuration number (C01 - C16) of the NCS running in the primary and secondary MDMs.
- [4] By checking to see if the frame counters (FRM CTR) for the PRI and SEC MDMs are incrementing, the crew can determine whether data is being received from the MDMs.
- [5] The SYNC field will display either 'YES' or 'NO' to indicate whether or not the SEC MDM is communicating with the PRI MDM. This field applies to the secondary MDM only. When the SEC MDM has lost sync with the PRI MDM, 'NO' will be displayed in the SYNC field and the crew will receive an alert light, tone, and fault message.
- [6] If any three or more FGB batteries read 25 volts or less, the FGB will send a C&W to the Node 1 MDMs, which will activate the load shed table. If this occurs, the LOAD SHED VIA FGB field will display 'YES' and a down-arrow will be displayed in the status field. The crew will also receive an alert light, tone, and fault message. Otherwise, the field will display 'NO'.
- [7] The CABIN PRESS field displays the Node 1 cabin pressure. When this parameter exceeds its lower/upper FDA limits, a down or an up arrow will be displayed in the status field. The crew will also receive a master alarm light and tone, a B/U C/W light on panel F7, and a fault message.
- [8] BUS CONFIG displays information on the ISS 1553B buses. The field to the right of the bus name displays the configuration of the buses connected to the specified MDM. This field will read either 'BC' for bus controller, 'RT' for remote terminal, or 'NA' for not available.
- [9] ISS C&W TONE STATUS: Since the Early Portable Computer System (PCS) doesn't have the capability to annunciate alarm tones, the tone status flag from the NCS will be used to trigger the Orbiter C&W system. When the tone status flag is set for any FIRE, WARNING, or CAUTION event, a down-arrow will be displayed in the appropriate status field. For a 'FIRE' event, the crew will receive a master alarm light and tone, a B/U C/W light on panel F7, and a fault message. For 'WARN' and 'CAUT' events, the crew will receive an alert light, tone, and fault message. The crew will then have to refer to the PCS for details on the fault condition.

ITEM ENTRY CHARACTERISTICS: SM 210 NODE 1 DISPLAY

- Items 1 and 2: STBY - allows the crew to command either the primary or secondary MDM to the Standby state.
- Item 3: N1-1 TO SEC - commands N1-1 to the secondary state.
- Item 4: LOAD SHED VIA NCS - activates the Node 1 Load Shed Table, which will power off everything in the Node 1, except the MDMs. This command will be used by the crew in response to a fire in the Node. This command is protected to prevent inadvertent execution; therefore, an ITEM 4 + 99 entry is required. Currently, there is no telemetry from the NCS to indicate the status of the load shed. The load shed table can also be activated without crew or ground intervention.
- Items 7 --- 12: N1-1 POWER ON/OFF - allows the crew to close (Power On) and open (Power Off) the RPCs associated with the MDM power supplies and Solenoid Driver Output (SDO) A and B cards. An asterisk will be displayed next to the appropriate item number to indicate the power status. A down-arrow will be displayed in the Trip Status field when an RPC has tripped. The crew will also receive an alert light, tone, and fault message.
- Items 13 --- 18: N1-2 POWER ON/OFF - allows the crew to close (Power On) and open (Power Off) the RPCs associated with the MDM power supplies SDO A and B cards. An asterisk will be displayed next to the appropriate item number to indicate the power status. A down-arrow will be displayed in the Trip Status field when an RPC has tripped. The crew will also receive an alert light, tone, and fault message.
- Items 19 --- 34: BUS CONFIG CH A/CH B - allows the crew to select either Channel A or B on each of the buses. An asterisk will be displayed next to the appropriate item number to indicate the selected channel.
- Items 19 and 20: UB ORB N1-1 CH A/CH B - allows the crew to select which channel (A, B) the N1-1 MDM will communicate on the UB ORB N1-1 bus.
- Item 21 and 22: CB GNC-1 CH A/CH B - allows the crew to select which channel (A, B) the N1-1 MDM will communicate on the CB GNC-1 bus.
- Items 23 and 24: LB LAB SYS-1 CH A/CH B - allows the crew to select which channel (A, B) the N1-1 MDM will communicate on the LB LAB SYS-1 bus.
- Items 25 and 26: UB ORB N1-2 CH A/CH B - allows the crew to select which channel (A, B) the N1-2 MDM will communicate on the UB ORB N1-2 bus.
- Items 27 and 28: CB GNC-2 CH A/CH B - allows the crew to select which channel (A, B) the N1-2 MDM will communicate on the CB GNC-2 bus.
- Items 29 and 30: LB LAB SYS-2 CH A/CH B - allows the crew to select which channel (A, B) the N1-2 MDM will communicate on the LB LAB SYS-2 bus.

Items 31 and 32: UB EPS N1-14 CH A/CH B - allows the crew to select which channel (A, B) the PRI MDM will communicate on the UB EPS N1-14 bus.

Items 33 and 34: UB EPS N1-23 CH A/CH B - allows the crew to select which channel (A, B) the PRI MDM will communicate on the UB EPS N1-23 bus.

SPEC 212 OIU DISPLAY

123456789012345678901234567890123456789012345678901

1	XXXX/212/XXX	OIU	XX X DDD/HH:MM:SS
2			DDD/HH:MM:SS
3	OIU 1 TEMP +XXXXS	OIU STATUS CTR XX	
4	OIU 2 TEMP <u>-XXXXS</u>	ISS BC TIME XX-XX-XX/XX:XX:XX	
5			
6			
7			
8			
9			
10			
11			
12			
13			
14			
15			
16			
17			
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19			
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22			
23			
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25			
26			

PARAMETER CHARACTERISTICS: SM 212 OIU DISPLAY

CRT NAME	MSID	UNITS	DISPLAY RANGE	STATUS INDICATORS				FDA (Limits)		
				H	L	M	↑	↓	HI	LO
OIU 1 TEMP [1]	P50T4000V	°F	-23.4 to +304.3			M	↑		212	-----
OIU 2 TEMP [1]	P50T4001V	°F	-23.4 to +304.3			M	↑		212	-----
OIU STATUS CTR	P50U4100D	SEC	00 --- 59						-----	-----
ISS BC TIME MM-DD-YY/HH:MM:SS [2]	P50U4110D	[2]	[2]						-----	-----
ACTIVE DEVICES PD 1 BITS 0-5 [3]	P50X4401E→P50X4406E	-----	OIU, CC1, CC2, SR1, SR2, MP1, MP2, N1-1, N1-2, FG1, FG2						-----	-----
ACTIVE DEVICES PD 2 BITS 0-5 [3]	P50X4411E→P50X4416E	-----	OIU, CC1, CC2, SR1, SR2, MP1, MP2, N1-1, N1-2, FG1, FG2						-----	-----
ACTIVE DEVICES PD 3 BITS 0-5 [3]	P50X4421E→P50X4426E	-----	OIU, CC1, CC2, SR1, SR2, MP1, MP2, N1-1, N1-2, FG1, FG2						-----	-----
ACTIVE DEVICES PD 4 BITS 0-5 [3]	P50X4431E→P50X4436E	-----	OIU, CC1, CC2, SR1, SR2, MP1, MP2, N1-1, N1-2, FG1, FG2						-----	-----
ACTIVE DEVICES BUS 1 [4]	P50U4055D	-----	0 --- 7 [4]						-----	-----
ACTIVE DEVICES BUS 2 [4]	P50U4065D	-----	0 --- 7 [4]						-----	-----
ACTIVE DEVICES BUS 3 [4]	P50U4075D	-----	0 --- 7 [4]						-----	-----
ACTIVE DEVICES BUS 4 [4]	P50U4085D	-----	0 --- 7 [4]						-----	-----
ACTIVE DEVICES LOCK 1 BITS 1, 2 [5]	P50X4440E, P50X4441E	-----	NONE = 00, YES = 01, NO = 10, N/A = 11						-----	-----

PARAMETER CHARACTERISTICS: SM 212 OIU DISPLAY (Cont)

CRT NAME	MSID	UNITS	DISPLAY RANGE	STATUS INDICATORS				FDA (Limits)		
				H	L	M	↑	↓	HI	LO
ACTIVE DEVICES LOCK 2 BITS 1, 2 [5]	P50X4450E, P50X4451E	-----	NONE = 00, YES = 01, NO = 10, N/A = 11						-----	-----
ACTIVE DEVICES LOCK 3 BITS 1, 2 [5]	P50X4460E, P50X4461E	-----	NONE = 00, YES = 01, NO = 10, N/A = 11						-----	-----
ACTIVE DEVICES LOCK 4 BITS 1, 2 [5]	P50X4470E, P50X4471E	-----	NONE = 00, YES = 01, NO = 10, N/A = 11						-----	-----
PDI DCM 1 (BIT, WORD, FRAME) SYNC	V75X6403D→ V75X6401D	-----	'*' = 1, blank = 0						-----	-----
PDI DCM 2 (BIT, WORD, FRAME) SYNC	V75X6407D→ V75X6405D	-----	'*' = 1, blank = 0						-----	-----
PDI DCM 3 (BIT, WORD, FRAME) SYNC	V75X6411D→ V75X6409D	-----	'*' = 1, blank = 0						-----	-----
PDI DCM 4 (BIT, WORD, FRAME) SYNC	V75X6415D→ V75X6413D	-----	'*' = 1, blank = 0						-----	-----
OIU CMD CTR [6]	P50U4130D	-----	000 --- 255						-----	-----
OIU PSP I/F [7]	P50X4283E	-----	OK, ERR						-----	-----
FLOAT POINT [8]	P50X4288E	-----	OK, ERR						-----	-----
PSP LAST CMD	V92X1102X, V92X1116X, V92X1129X	-----	OK, REJ, INC						-----	-----
OIU LAST CMD	P50X4281E, P50X4303E	-----	OK, REJ						-----	-----
SSOR PRI FRM SYNC	V74X2050E	-----	YES, NO			M			-----	-----
SSOR PRI STATUS	V74X2051E	-----	OK, BAD			M			-----	-----
SSOR B/U FRM SYNC	V74X2053E	-----	YES, NO			M			-----	-----
SSOR B/U STATUS	V74X2052E	-----	OK, BAD			M			-----	-----

REMARKS

- [1] These parameters will read 140 °F when the OIU associated with that measurement is OFF. Note that the only sure method to determine which OIU is powered up from this display alone (without referring to the OIU SSP power talkback) is to look for the 'OFF' temperature noted above. An up arrow will be displayed when the temperature FDA limit is reached, and an 'M' will be displayed when the associated data is missing.
- [2] The ISS BC Time follows the format MM-DD-YY/HH:MM:SS. The OIU Status Counter displays the OIU Time parameter for seconds, reading from 00 to 59 and resetting to 00 again. This display item is intended to indicate OIU health by constantly counting from 00 to 59 and recycling when the OIU telemetry is being processed by the PDI. The ISS BC time comes from whichever device is BC to the OIU on one of its MS 1553B busses. This parameter will read all zeroes at power-up, will show the correct BC time at the time the BC comes up and starts sending telemetry to the OIU, and will remain static at the last good sample when the incoming MS 1553B telemetry from that BC goes away.
- [3] PD: OIU (default when no active device assigned, also displayed when in a format which supports an OIU Error Log Dump)
CC1 (CC2) ISS Command and Control MDM #1 or #2
SR1 (SR2) Space to Space Orbiter Radio (SSOR) #1 or #2
MP1 (MP2) ISS Mini Pressurized Logistics Module (MPLM) MDM #1 or #2
N1-1 (N1-2) ISS Node 1 MDM #1 or #2
FG1 (FG2) ISS FGB MDM #1 or #2
- [4] BUS: OIU MS 1553B Bus #1 to #7, with #8 reading '0'.
(Note-Current OIU hardware only supports Busses #1 to #4)
- [5] NONE if the current OIU Format does not have an AD for this display location
YES if the OIU is RT and in sync with the AD (AD is an ISS BC or SSOR)
YES if the AD is OIU in error log dump format (OIU must be in sync with itself)
NO if the OIU is RT and was in sync with the AD but has lost lock on the AD (ISS BC or SSOR)
N/A if the OIU is BC to the AD, except if the AD is SSOR

Note that if LOCK goes from 'YES' to 'NO', the OIU stops attempting to acquire sync with that AD. To force the OIU to attempt to resync with an AD (ISS BC through MS 1553 bus direct or through the SSOR), the appropriate OIU Format must be reloaded, thus forcing a resync attempt.
- [6] The OIU Command Counter will start at '000' at power-up, and will increment by one whenever the OIU receives a valid command from the PSP. The counter reads in decimal, and will count from '000' to '255' and roll over to '000'. All commands, whether from the MCC or the MCDS will cause the counter to increment if received and processed by the OIU.
- [7] The PSP I/F (Interface) parameter indicates whether the OIU is receiving the 16 KHz command carrier from either PSP #1 or #2. This parameter will read as follows:
'OK' if the OIU is receiving the PSP command carrier
'ERR' if the OIU is not receiving the PSP command carrier.

- [8] The OIU can convert one ISS floating point parameter value per PDI minor frame (maximum of 100 per major frame) into a Shuttle PDI-compatible parameter value. If an ISS floating point value is invalid, or results in an invalid floating point value/operation during the conversion process, the OIU announces an error. The associated display parameter will read as follows:

‘OK’ if no floating point error

‘ERR’ if an invalid floating point value/operation is detected.

ITEM ENTRY CHARACTERISTICS: SM 212 OIU DISPLAY

- Item 1: FORMAT - This is an indexed command item entry, with OIU actual telemetry status. This item allows changing the OIU's PDI format (ITEM 1 + XXX EXEC). The range of allowable format numbers is 001 to 255, in decimal format. The status feedback is the currently loaded OIU PDI format.
- Item 2 --- 5: BUS 1 RT (BC, A, B) - This section allows changing the OIU's current MS 1553 B bus processing state (Bus Controller or Remote Terminal) and prime bus channel (A or B) for any of the currently implemented four OIU MS 1553 B busses. The status feedback is the actual OIU state for each bus and parameter, with an asterisk displayed to indicate the currently selected state. For example, if Bus 3 is BC, and using Channel A, there will be an asterisk next to Items 11 and 12. To change Bus 3 to RT, an 'ITEM 10 EXEC' is performed. In the case of the bus channelization ('A' or 'B'), the displayed telemetry indicates which channel is prime for command and telemetry transactions on that bus if the OIU is BC on that bus. If the OIU is BC on a bus, it will try to send a command for an active device associated with that bus using the prime channel. If the OIU receives no MS1553B status message from that active device, it tries again on the prime channel, then it tries on the alternate channel, and if the active device has not responded, it declares it failed and stops trying to send that command to that active device. When the OIU is RT on a bus, it will respond on either channel, depending on which channel received a MS1553B transaction from the BC; therefore, the channel priority has no meaning when the OIU is RT on a bus.
- Items 6 --- 9: BUS 2 RT (BC, A, B) - Same as BUS 1 RT (BC, A, B)
- Items 10 --- 13: BUS 3 RT (BC, A, B) - Same as BUS 1 RT (BC, A, B)
- Items 14 --- 17: BUS 4 RT (BC, A, B) - Same as BUS 1 RT (BC, A, B)
- Item 18: This item entry has command entry feedback only, no actual OIU feedback. This item entry is an indexed command which allows performing the following internal OIU function mapping:
- Item 18 + 1: Change FGB MDM Active Device to FGB-2 MDM Physical Device
 - Item 18 + 2: Change FGB MDM Active Device to FGB-1 MDM Physical Device
 - Item 18 + 3: Change Node 1 MDM Active Device to N1-2 MDM Physical Device
 - Item 18 + 4: Change Node 1 MDM Active Device to N1-1 MDM Physical Device
 - Item 18 + 5: Move FGB -2 MDM Physical Device to OIU Bus # 4 (UB ORB N1-2)
 - Item 18 + 6: Move FGB -2 MDM Physical Device to OIU Bus # 3 (UB ORB N1-1)
 - Item 18 + 7: Move FGB -1 MDM Physical Device to OIU Bus # 4 (UB ORB N1-2)
 - Item 18 + 8: Move FGB -1 MDM Physical Device to OIU Bus # 3 (UB ORB N1-1)

CAUTION MESSAGES

CAUTION MESSAGES TABLE..... 4-3

CAUTION

CAUTION

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CAUTION MESSAGE TABLE

Message Text	Condition	Action
MDM N1-1 CONTROL BUS GNC 1 FAIL - NOD1	TBD	TBD
MDM N1-1 DETECTED RT FAIL MDM N1-2 - PMA 1	TBD	TBD
MDM N1-1 LOCAL BUS SYS LAB 1 FAIL - NOD1	TBD	TBD
MDM N1-1 LOSS OF SYNC TO MDM N1-2 - PMA 1	TBD	TBD
MDM N1-1 USER BUS ORB N1-1 FAIL - NOD1	TBD	TBD
MDM N1-1(2) OPERATIONAL HEATER FAILED - NODE 1	TBD	TBD
MDM N1-1(2) SURVIVAL HEATER FAILED - NODE 1	TBD	TBD
MDM N1-2 CONTROL BUS GNC 2 FAIL - NOD1	TBD	TBD
MDM N1-2 DETECTED RT FAIL MDM N1-1 - PMA 1	TBD	TBD
MDM N1-2 LOCAL BUS SYS LAB 2 FAIL - NOD1	TBD	TBD
MDM N1-2 LOSS OF SYNC TO MDM N1-1 - PMA 1	TBD	TBD
MDM N1-2 USER BUS ORB N1-2 FAIL - NOD1	TBD	TBD
MDM PVCU 2B/4B SWITCHOVER FAILED-P6	TBD	TBD
MDM PVCU 4B(2B) FAILURE- P6	TBD	TBD
MDM PVCU 4B(2B) LOSS OF COMM-P6	TBD	TBD
PRIME NCS DETECTED BUSY BIT FAIL FOR SMCC - SM	TBD	TBD
PRIME NCS DETECTED FRAME COUNT FAIL FOR SMCC - SM	TBD	TBD
PRIME NCS DETECTED RT FAIL MDM FGB-2(1) – FGB	TBD	TBD
PRIME NCS DETECTED RT FAIL OIU – SHUTTLE	TBD	TBD
PRIME NCS DETECTED RT FAIL PRIME CCS – LAB	TBD	TBD
PRIME NCS DETECTED RT FAIL SMCC-1(2,3) - SM	TBD	TBD
PRIME NCS LOSS OF SYNC TO MDM PVCU-4B - P6	TBD	TBD
PRIME NCS LOSS OF SYNC TO SMCC – SM	TBD	TBD
PRIME NCS USER BUS EPS N1-23(14) FAIL - NOD1	TBD	TBD
PV LOCAL BUS ANCILLARY DATA ERROR- P6	TBD	TBD
PVCU 2B/4B POINT TO POINT DATA DISTRIBUTION ERROR- P6	TBD	TBD
PVCU 4B(2B) SPD1553 BUS CONTROLLER ERROR- P6	TBD	TBD
SM DETECTED MDM N1-1(2) FAIL - SM	TBD	TBD
SM LOSS OF SYNC TO MDM N1-1(2) - SM	TBD	TBD

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